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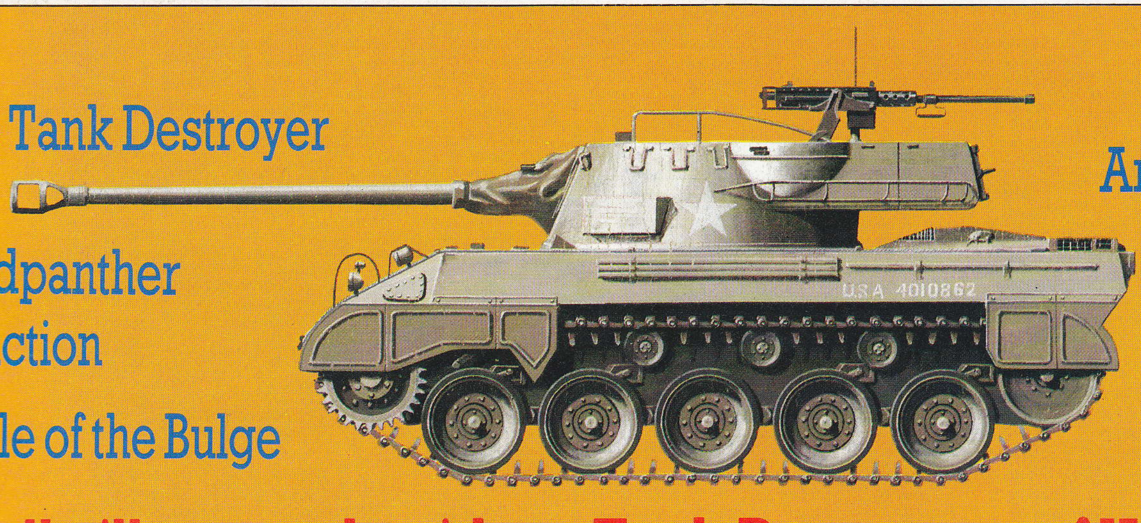

Armed Forces of the World: Soviet Air Force (Part 3)

A fully illustrated guide to Tank Destroyers of World War II

WAR MACHINE

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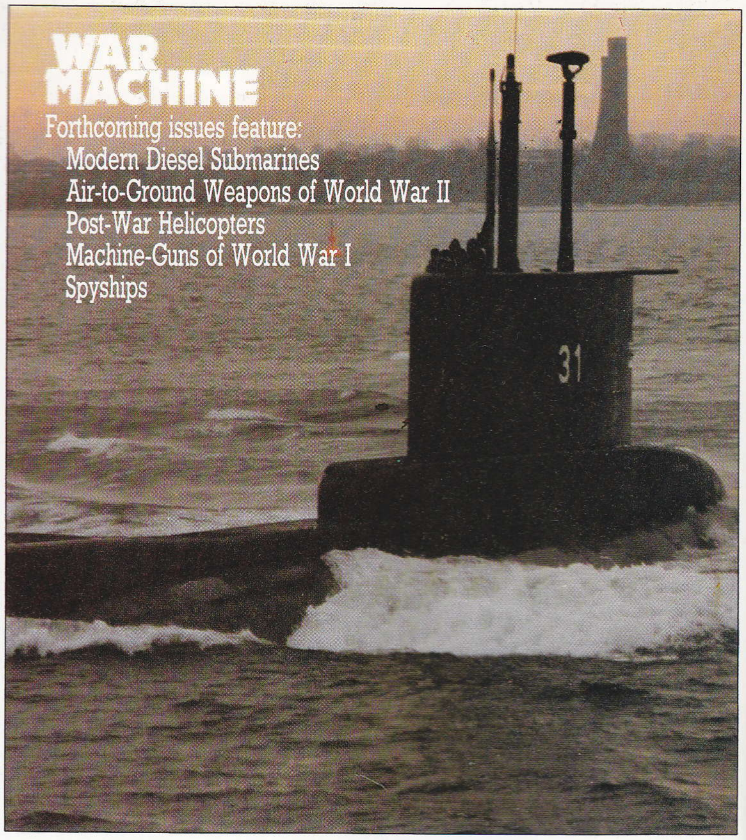

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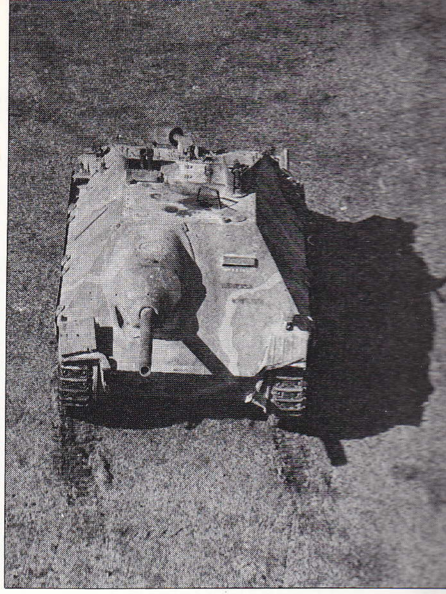
Tank Destroyers of World War 11



The small frontal area of the Jadgpanzer 38(t) Hetzer made the vehicle a difficult target to spot or hit, which assisted greatly in the Hetzer's overall protection. The Hetzer mounted a 75-mm (2.95-in) modified tank gun and was fast, handy and relatively easy to produce.

Successful tank designs are the product of a careful compromise between firepower, protection and mobility. Nevertheless, during World War II many of the belligerent nations resorted to producing 'tank destroyers', vehicles which sacrificed armour, speed or flexibility in order to carry a much more powerful gun than contemporary tanks.

The tank destroyer was very much a product of the military and economic developments peculiar to World War II. During the war years the tank destroyer flourished for various reasons which will be described in this study, but in the years that followed 1945 the type all but vanished, and it is a rare thing to find in modern tank parks. The truth was (and still is) that the tank destroyer has severe limitations as a fighting vehicle, but that it was capable of carrying a large-calibre gun, one far heavier than the corresponding tank chassis of the time could ever carry and fire.

The tank destroyer and the tank were very different beasts. Although they often used identical chassis, and at times even looked alike, they were markedly dissimilar when it came to combat. The tanks with their combination of firepower, mobility and protection usually had the combat edge over the tank destroyer with its limited-traverse armament and relatively thin armoured protection, but to be set against this the tank destroyer usually had the more powerful gun and a low silhouette that gave it the edge in concealment. There was at one time the philosophy that as tanks were not expected to fight tanks, specialized tank destroyers would have to be used. This approach did not last long under the severe strictures of combat, where it was soon learned that the best way to defeat a tank was to use another tank. The tank destroyer could be used for this purpose but at a cost in weapon flexibility and all too often in protection for the crew.

Tank destroyers were also important during World War II for purely economic and production reasons. Among the types of tank destroyer and German Panzerjäger (tank hunter) were some superb fighting vehicles such as the Hetzer, the M18 Hellcat and the superlative Jagdpanther, of which the last would be a viable fighting machine today. But there were some dreadful lash-ups that were undergunned, lacked protection for their unfortunate crews and, in addition to these failings, were so underpowered they had difficulty in moving at combat speeds. Add to these lumbering monsters such as the Jagdtiger,and the scope of this study can be appreciated.

The Gun Motor Carriage M36 was a late war version of the M10 series mounting a 90-mm (3.54-in) anti-aircraft gun as a counter to the German equivalents. It was used in Europe from late 1944 onwards, but never in large numbers. It was relatively lightly armoured and the turret had no overhead protection.

GERMANY

Panzerjäger I

When the first PzKpfw I (Panzerkampfwagen I) light tanks were produced in 1934 it was intended that they would be used only as training vehicles, but in the event they had to be used as combat tanks during the early war years for the simple reason that larger and heavier tanks were not yet available in sufficient numbers. But the PzKpfw I had a crew of a mere two men, carried only a machine-gun armament, and was poorly protected by thin armour. By no stretch of the imagination was it a viable battle tank and most were phased out of use after the end of 1940 (but retained for the original training role). This left a number of spare tank chassis with no operational role, so the opportunity was taken to convert these vehicles into the first German self-propelled gun.

It had already been decided that some form of mobile anti-tank gun would be a great asset to the anti-tank units who would otherwise have to use towed guns. Thus the first example of this requirement was met by mounting a 3.7-cm (1.456-in) Pak 35/36 onto a turretless PzKpfw I. While this conversion showed promise it was not adopted because even by mid-1940 it was appreciated that the 37-mm gun lacked power to deal with future armour. Thus a Czech 47-mm (1.85-in) anti-tank gun was mounted instead, and this combination was adopted for service as the **Panzerjäger I für 4.7-cm Pak(t)**.

The Czech gun was a powerful, hard-hitting weapon that was well capable of penetrating most armour it was likely to encounter and Alkett AG produced a total of 132 conversions. The result was very much a first attempt, for all that was required was to remove the original turret, plate over the front of the turret ring and arrange a small working platform over the engine covers. The gun was mounted in a small shield that was left open at the top and rear. The crew consisted of the driver, still using his original PzKpfw I position, and two men serving the gun. A total of 74 rounds could be carried as standard, although more could be added to this total. The chassis mainly used for the conversion was that of the PzKpfw I Ausf B.

The Panzerjäger Is served in North Africa and during the early stages of the campaigns in the Soviet Union. They proved to be powerful enough to defeat opposing tanks, but their overall lack of protection for the crew made them very vulnerable targets. Accordingly when better equipments became available they were withdrawn from front-line use and assigned to theatres where they could be used for policing rather than for combat duties. Among the locations so honoured were the Balkans, where the vehicles were used on anti-partisan operations. Units operating on the Eastern Front after about the end of 1942 frequently removed the guns and used the chassis for supply carrying, and some units replaced their Czech guns with captured ex-French 47-mm guns. Few Panzerjäger Is remained in use after mid-1944.

Specification

Panzerjäger I

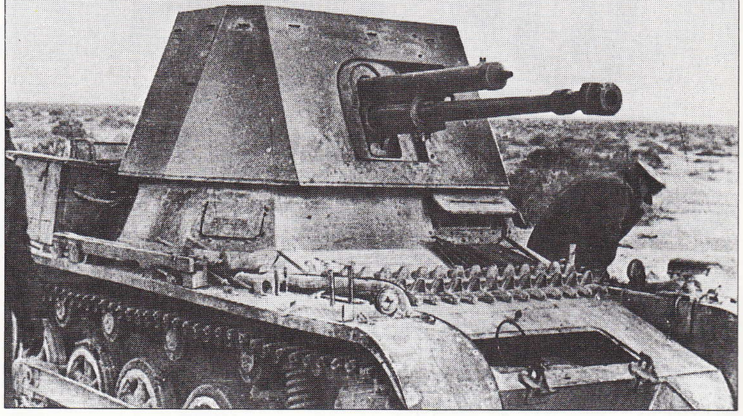
Crew: 3

Weight: 6000 kg (13,228 lb)

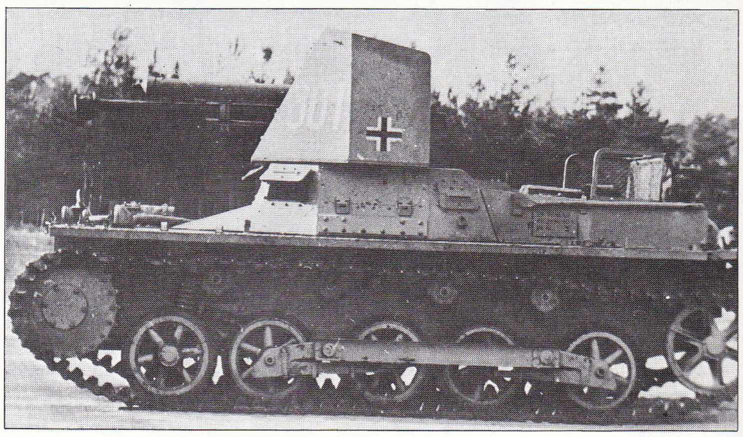
Powerplant: one Maybach NL 38 6-cylinder petrol engine developing 74.6 kW (100 hp)

Dimensions: length overall 4.14 m (13 ft 7 in); width 2.013 m (6 ft 7.25 in); height 2.1 m (6 ft 10.7 in)

Performance: maximum road speed 40 km/h (24.8 mph); range 140 km (87 miles); gradient 57 per cent; vertical obstacle 0.37 m (14.6 in); trench 1.4 m (4 ft 7 in); fording 0.6 m (2 ft)



This SdKfz 101 Panzerjäger 1 was the first example captured by the Allies in North Africa and was subjected to a great deal of technical scrutiny. It mounted an ex-Czech 4.7-cm (1.85-in) anti-tank gun in an open mounting that used only a frontal shield for crew protection.



This photograph of a Panzerjäger I shows the extemporized nature of this early German conversion, made in an attempt to prolong the service life of the PzKpfw 1 light tank. The gun was powerful enough, but the mounting provided virtually no protection.

GERMANY

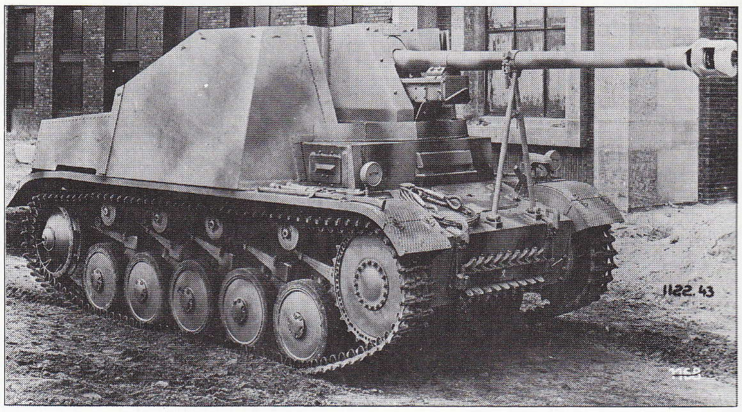
Marder II

As with the PzKpfw I, when the PzKpfw II entered service in 1935 it was meant to be used only as a training and development tank. In the event it had to be used as a combat tank from 1939 to 1942 simply because there were not enough combat tanks to replace the type, which acquitted itself well enough despite the fact that its main armament was limited to a 2-cm cannon: by 1941 the PzKpfw II was overdue for replacement as its armament was not able to penetrate other than soft-skin targets and the small turret ring could not accommodate a heavier weapon. However, the production line for the chassis was still in being and at the time it seemed to be too valuable to waste so the opportunity was taken to convert the PzKpfw II to a Panzerjäger.

The prototype of this new Panzerjäger was fitted with a 5-cm (1.97-in) anti-tank gun, but the full production version was fitted with a special version of the 7.5-cm (2.95-in) Pak 40 anti-tank gun known as the Pak 40/2. This powerful gun was the German army's standard anti-tank weapon and the incorporation of greater mobility added considerably to the gun's anti-armour potential. The gun was placed behind a 10-mm (0.39-in) thick armoured shield that sloped to the rear to provide the gun crew with adequate protection. To accommodate the weight of the gun the engine was moved to the rear of the hull and the engine covers were used as a working platform to serve the gun. The vehicle was known as the **Marder II** (Marder meaning marten) although other and more cumbersome designations (such as **7.5-cm Pak 40/2 auf Slf II**) were used on official documents.

The Marder II remained in production until 1944 and became one of the most widely used of all the many German self-propelled gun conversions. In production terms it was manufactured in greater numbers than any other weapon of its type, for 1,217 were made. The Marder II was certainly a handy and efficient weapon in combat for it was relatively small, had a good cross-country performance and the gun could knock out virtually any enemy tank other than super-heavy Soviet tanks such as the IS-2. Racks for 37 rounds were provided over the engine covers and there was also space for stowing 600 rounds for the machine-gun usually carried; this was a 7.92-mm (0.312-in) MG34 or MG42.

Most Marder II production was sent to the Eastern Front, but the Marder II was found wherever German troops were in action. By 1944 the type was out of production and the crew was often reduced by one man to conserve manpower, but the development of the type did not cease. During the latter stages of the war some Marder IIs were equipped with infra-red searchlights for engaging targets at night and some of these equipments were used in action on the Eastern Front during the last stages of the war. By then such novel equipment could have but little impact on the outcome of the war.



The SdKfz 131 Marder II mounted a 7.5-cm (2.95-in) Pak 40/2 and was one of the more important of the Panzerjäger conversions. Based on the PzKpfw II Ausf A, C or F, 1217 were produced to be used on all fronts. The crew was four, including the driver.

Specification

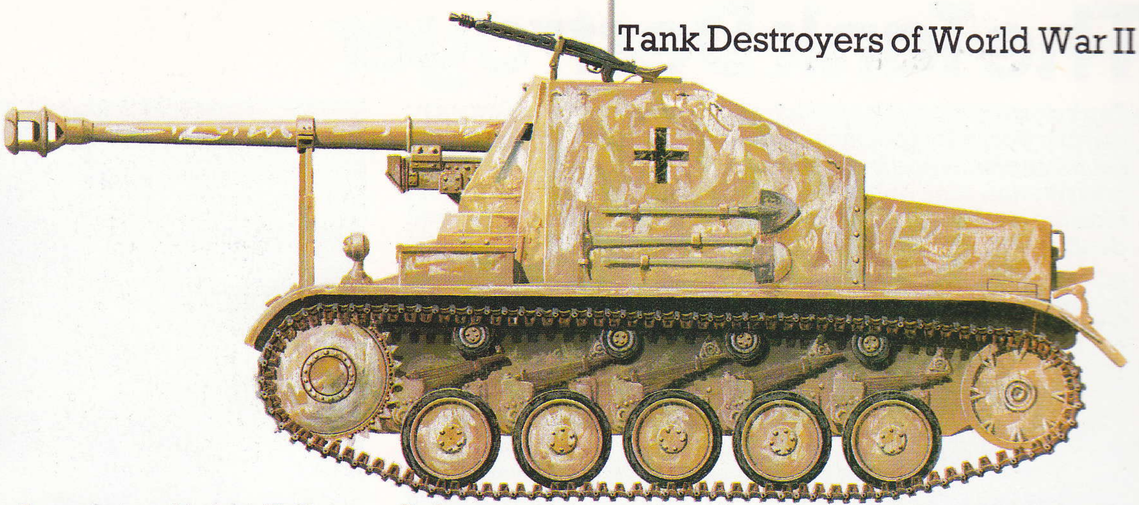
Marder II

Crew: 3 or 4

Weight: 11000 kg (24,251 lb)

A Marder II with the 7.5-cm (2.95-in) Pak 40/2 gun barrel clamps lowered. Although this vehicle was one of the more important (numerically) of the Panzerjäger, it was rather high and generally lacked protection.

Powerplant: one Maybach HL 62 petrol engine developing 104.4 kW (140 hp)
Dimensions: length 6.36 m (20 ft 10.4 in); width 2.28 m (7 ft 5.8 in); height 2.20 m (7 ft 2.6 in)
Performance: maximum road speed 40 km/h (24.8 mph); road range 190 km (118 miles); gradient 57 per cent; vertical obstacle 0.42 m (16.5 in); trench 1.8 m (5 ft 11 in); fording 0.9 m (35 in)



This profile of the Marder II shows the rather high mounting of the 7.5-cm (2.95-in) Pak 40/2, a special version of the standard German anti-tank gun of the late war years.

GERMANY

Marder III

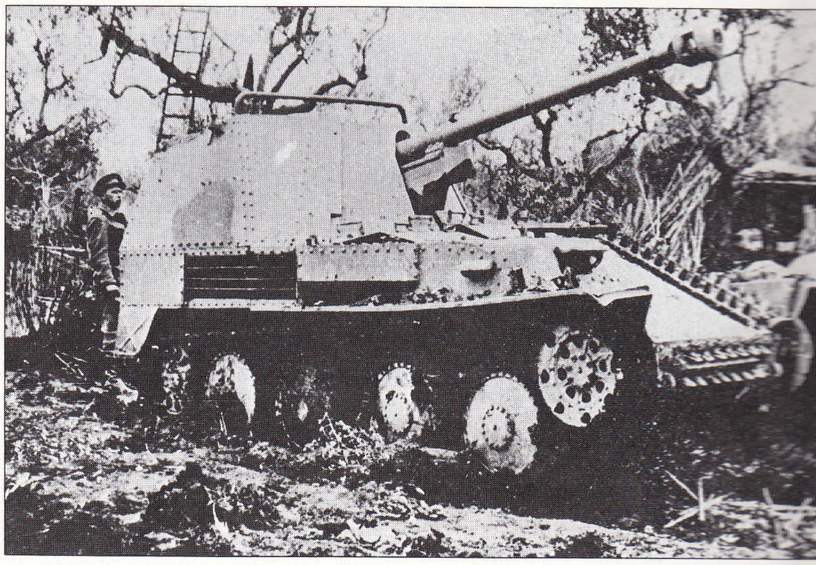
There were two self-propelled guns that were known as the **Marder III**, and both used the same chassis, a derivation of the Skoda TNHP-S tank chassis. This tank had originally been produced by the Skoda factory at Pilsen for the Czech army, but with the annexation of the Czech state by Germany in 1939 the Skoda works continued production of tanks under the designation PzKpfw 38(t) for the German army. The Germans introduced many production and in-service changes to the original Skoda design, and by 1941 the PzKpfw 38(t) may be regarded as a German design, but the original turret was too small to carry weapons powerful enough to defeat enemy armour after 1941, and the chassis was then kept in production for a number of alternative purposes.

One of these purposes came to light in 1941. The appearance of tanks such as the Soviet T-34 meant for a while that the German army had no anti-tank gun powerful enough to knock them out and all manner of hasty improvisations were made to counter this state of affairs. One was to take the chassis of the PzKpfw 38(t) and mount on it a captured Soviet field gun, the 76.2-mm (3-in) Model 1936. This was a very good dual-purpose weapon that could be used as an anti-tank weapon, and the Germans even went to the length of converting some for use as specialized anti-tank guns. On the PzKpfw 38(t) the gun was mounted in a fixed shield and the conversion went into production in early 1942 as the Marder III, otherwise the **Panzerjäger 38(t) für 7.62-cm Pak 36(r)**. Some 344 of these conversions were made, and the Marder III was used not only on the Eastern Front but in North Africa and elsewhere. However, it was at the time regarded only as a stopgap until sufficient numbers of the German 7.5-cm (2.95-in) Pak 40 became available. When this happened during 1942 production of the Soviet-gunned Marder III ceased and that of the German-gunned version commenced. The gun/chassis combination was still called the Marder III, but had the designation **Panzerjäger 38(t) Ausf H für 7.5-cm Pak 40/3** and used a slightly differing gun shield and mounting from the earlier model. The first of the Pak 40-armed Marder IIIs were rushed into action during the last stages of the Tunisian campaign where some were captured, providing Allied intelligence staffs with something to mull over. But their 'find' did not last for long, for the Marder III was soon to undergo another transformation.

Up to 1943 the various German self-propelled guns using the Skoda chassis used the PzKpfw 38(t) tank as a basis. However, with some early conversions (including the original Marder III) the vehicles were nose-heavy, which at times limited mobility. Using the original Czech design as a basis, German engineers now relocated the engine at the front of the chassis and moved the 'working platform' to the rear to produce a specialized self-propelled gun carrier. As soon as this became available Marder III production changed once more to the new **Panzerjäger 38(t) Ausf M für 7.5-cm Pak 40/3** configuration with the gun and its protection mounted at the rear of the vehicle. This provided a much better balanced vehicle and the new chassis was also used to mount a variety of other weapons. The late type of Marder III was manufactured by BMM of Prague, and when production ceased in May 1944 799 had been made. They were used on all fronts.

Specification

Panzerjäger 38(t) Ausf M
Crew: 4
Weight: 11000 kg (24,251 lb)
Powerplant: one Praga AC petrol engine developing 111.9 kW (150 hp)
Dimensions: length overall 4.65 m (15 ft 3.1 in); width 2.35 m (7 ft 8.5 in); height 2.48 m (8 ft 1.6 in)
Performance: maximum road speed 42 km/h (26 mph); road range 140 km (87 miles); gradient 57 per cent; vertical obstacle 0.84 m (33 in); trench 1.3 m (4 ft 3 in); fording 0.9 m (35 in)



The later Marder IIIs had the main gun position moved to the rear of the chassis and the engine to the front. This provided a better-balanced and more handy vehicle, and nearly 800 were produced, still using the basic components of the PzKpfw 38(t) tank.

This Marder III was captured in North Africa in April 1943 and mounted its 7.5-cm (2.95-in) Pak 40/3 in a central position. It was a very simple conversion of a Czech tank chassis but was effective enough.

The Tank Destroyer

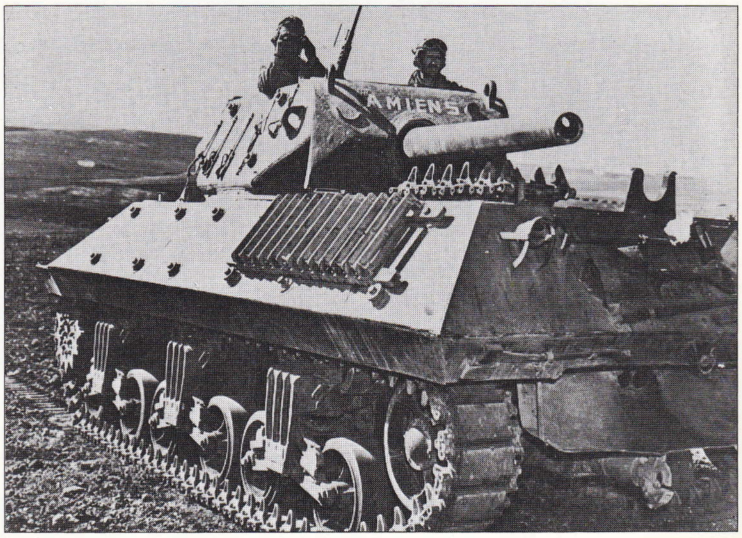
Tank destroyers were as much the product of expediency as combat doctrine; specifically-designed 'tank killers' were soon supplemented by obsolescent vehicles modified to carry massive anti-tank guns. The German late-war tank destroyers took the concept to its logical conclusion and were capable of dealing with any tank on the battlefield.

The concept of the tank destroyer as a vehicle different from the battle tank may be considered to originate in two basic philosophies: one is the concept of the tank destroyer as an armed vehicle produced specifically for tactical deployment as a tank killer; and the other is the philosophy of using existing tanks or other armoured vehicles to carry weapons larger and more powerful than those for which they were originally designed. Both philosophies were current in World War II.

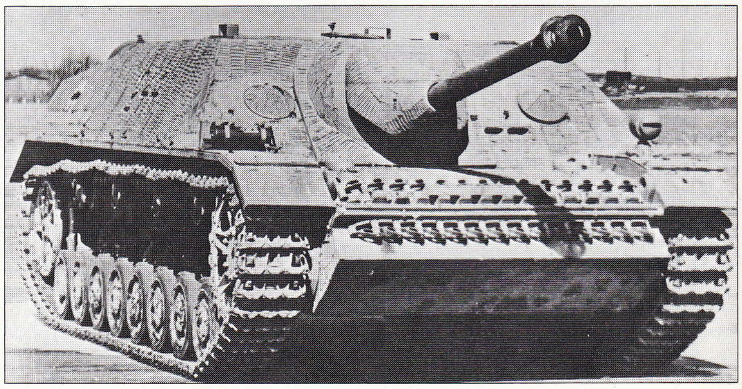
The concept of vehicles designed specifically as anti-armour weapons was very much a result of American thinking during the late 1930s and early 1940s. The Americans came up with the idea that fast-moving armoured columns, epitomized by the Panzer divisions of the German army, could be arrested in their forward progress only by the use of massed high-velocity guns of large calibre, both towed and self-propelled. At that time it was fashionable in some armies to consider that tanks would not meet tanks in combat, but exactly why is now difficult to fathom for it soon emerged that the tank was indeed the ideal platform with which to counter enemy tanks. The tank had good mobility, a powerful main armament and protection for the crew in combat. The vehicles that emerged as the specialized tank destroyers used by the US Army lacked this overall balance. While they did indeed have powerful main guns, they lacked protection for the crew and with the exception of the remarkable M18 Hellcat their overall performance in action was such that they gained little in mobility over conventional tanks. By 1944 this had been realized by the US Army, and the specialized tank destroyer vehicles were diverted to the more conventional armoured formations, by which they were used as assault guns or even self-propelled artillery.

Thus the American tank destroyer concept may now be seen as an aberration, and it was in the second concept that the tank destroyer had its main origins during World War II. Many of the tanks that were in use when World War II began may now be seen as being undergunned, a situation common to nearly all tank designs of the period when it was considered that there would be little call for tank guns with calibres larger than about 40 mm (1.57 in) on the grounds that opposing tanks would be relatively lightly armoured and that really heavy guns would thus not be needed. Therefore, tanks could be produced that were relatively small and possessed of small turrets and, more importantly, small turret rings. This state of affairs did not last long once combat started in earnest during 1940: It was soon learned that new tanks had thicker and thicker armour bands applied to their hulls, and the only way to get through this armour was to use heavier projectiles fired from larger-calibre guns. This was acutely demonstrated by the arrival of the T-34 tanks during 1941, for with their combination of thick armour and a powerful 76-mm (3-in) gun they were virtually invulnerable to German countermeasures for a period. Even before the arrival of the T-34 the British Matilda had demonstrated during May 1940 that its armour was proof against existing German anti-tank and tank guns.

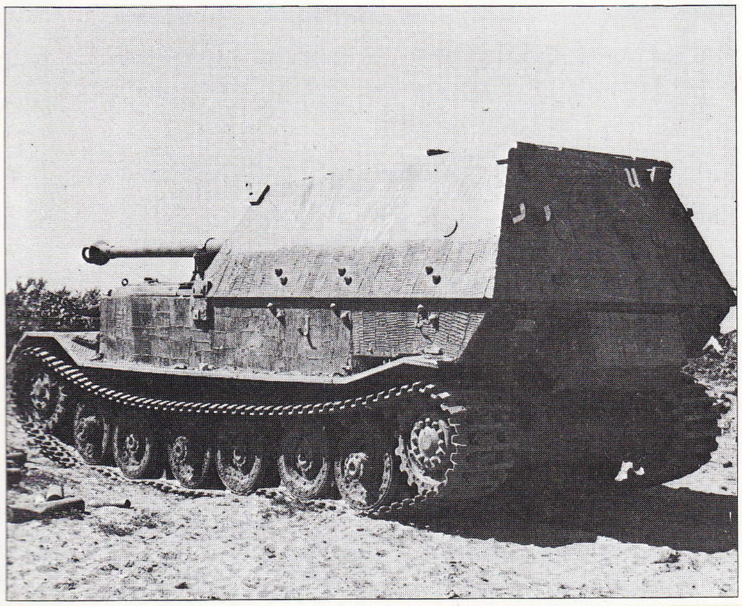
The main problem for tank designers lay in the turret ring, which absorbed most of the gun recoil forces. Most tanks of that period were already fitted with weapons as large in calibre as their turret rings could bear. The only way to fit



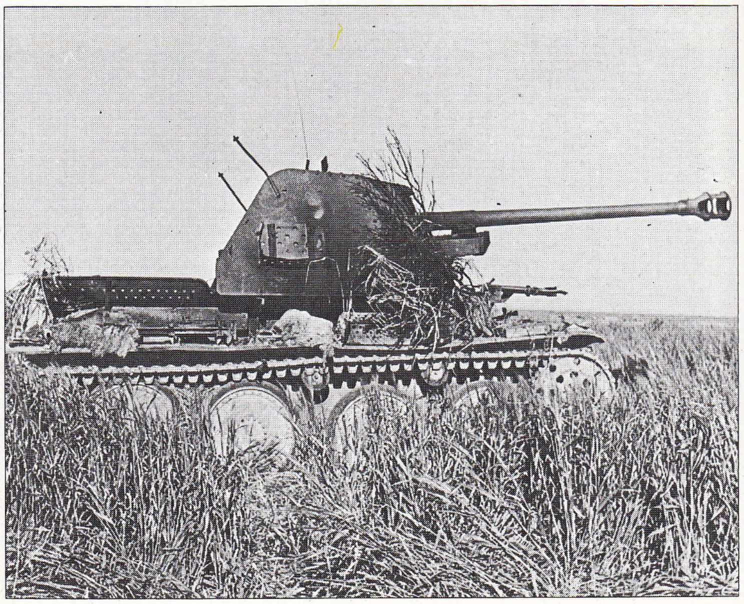
The American M10 was used by several of the Allied armies including that of the Free French, seen here on exercises in North Africa. The M10 was based on the widely-used M4 chassis, but was relatively lightly armoured and had an open-topped turret mounting the main 7.62-mm (3-in) high velocity gun.



Based on the widely-used Panzer IV chassis, the Jadgpanzer IV combined a powerful 7.5-cm (2.95-in) Pak 39 gun with a low well-armoured superstructure and good overall performance. Well-sloped armour added to the overall protection for the crew of four. Later versions mounted a longer 7.5-cm gun.



This Elefant, captured in Italy, bears a written warning that booby traps are suspected to have been attached. This photograph shows the size of the main fighting compartment for the crew of six, but this made it a bulky vehicle that was difficult to hide and easy to hit.



The SdKfz 139 Marder III series was typical of the improvised Panzerjäger produced by the Germans that were still very efficient fighting vehicles. Based on a Czech tank chassis, the Marder III carried a 7.5-cm (2.95-in) Pak 40/3 gun and was handy and powerful for its role. This is an early type.

bigger guns was to produce tanks with larger turret rings and that took time, more time than could usually be spared. Designing a tank from scratch and setting up the necessary production lines from nothing was a lengthy process which only nations such as the United States could even contemplate overcoming in a short time. Thus many of the early World War II tanks were virtually obsolete within a few months of taking the field, yet some form of vehicle to mount larger guns had to be found.

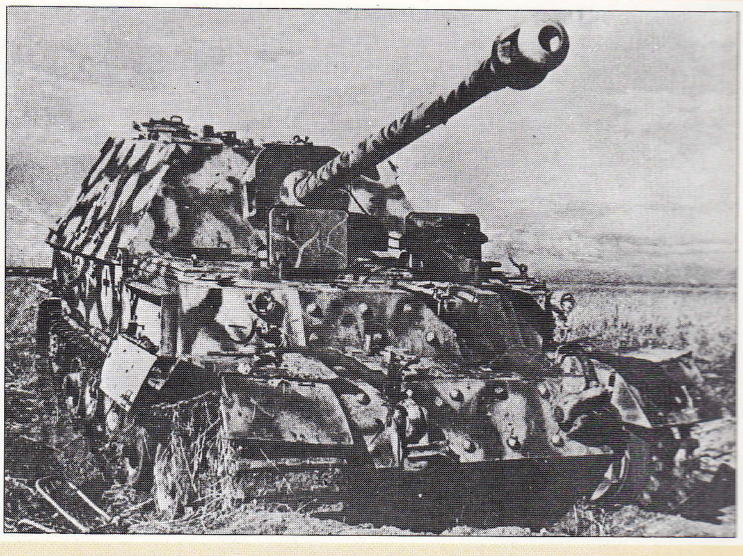
The answer was the conversion of the existing tanks to accommodate new superstructures in which the larger-calibre guns could be mounted in limited-traverse mountings. Usually this meant removing the old turret and turret ring and building onto the chassis a boxlike superstructure, usually with sloped sides to improve projectile deflection, with the new gun mounted on the front plate. There were many of these conversions during the years 1940 to 1943, usually by the German army who termed their conversions Panzerjäger (tank hunters), for the conversions were intended as tank destroyers. One important fact to remember when considering the Panzerjäger is that they were not tanks. One of the main attributes of the tank is still its combination of firepower, mobility and protection, and the Panzerjäger/tank destroyer often lacked at least two of these attributes. Most of the Panzerjäger and their ilk were only thinly armoured. And, being vehicles from an earlier generation, they were generally underpowered for the new loads they had to carry, and mobility was thus impaired.

The early generation of conversions was replaced by full production examples, at first by using existing production lines and then by designing and producing purpose-built designs specifically for the Panzerjäger/tank destroyer role. For nations such as Germany this was a deliberate policy to boost the number of armoured vehicles in the field, for it was appreciated by them that a limited-traverse mounting on a tracked chassis could be produced in less time and at far less cost than a turreted tank on the same chassis. This expediency cost something tactically, for the limited-traverse main armament had severe tactical disadvantages.

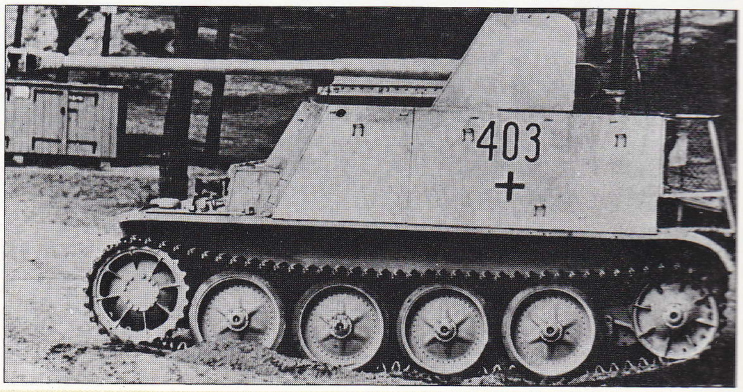
The main disadvantage was the limited traverse itself. In mobile armoured warfare targets can appear from any point of the compass, and if a target appeared to the side of a Panzerjäger the entire vehicle had to be turned towards it, which often took too long: once the Panzerjäger had been turned the target had either gone or had been able to get in its first important shot, with all its consequences. Set against this was the fact that the tank destroyers with their low hulls often had a much lower silhouette than corresponding tanks, so they were easier to conceal, the Hetzer providing the supreme example. They were thus usually used as ambush weapons that could lie in wait for targets and then move out after firing before being spotted for the inevitable retaliation; here the British Archer provides a good example.

Thus the World War II tank destroyer was very much a compromise between weapon power and production expediency. It was relatively easy to produce but in action lacked the overall combat efficiency of the tank. It relied almost entirely on its main weapon for its existence, as the limited-traverse mounting could carry a gun much heavier than that of a tank of similar size and weight. Later designs had far more power than the hasty improvisations of the war years, and thus had more mobility.

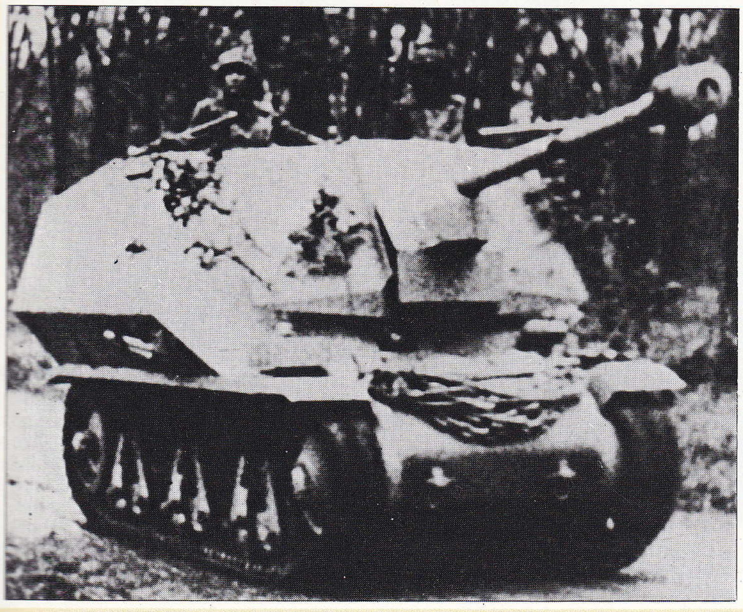
After World War II the tank destroyer concept all but died, and today there are only a few in-service armoured vehicles that reflect the philosophies of the war years; some of these are based on the use of guided missiles. It has been accepted that the best counter to the tank is another tank, and now that the production pressures of wartime have gone, the tank destroyer has all but passed away.



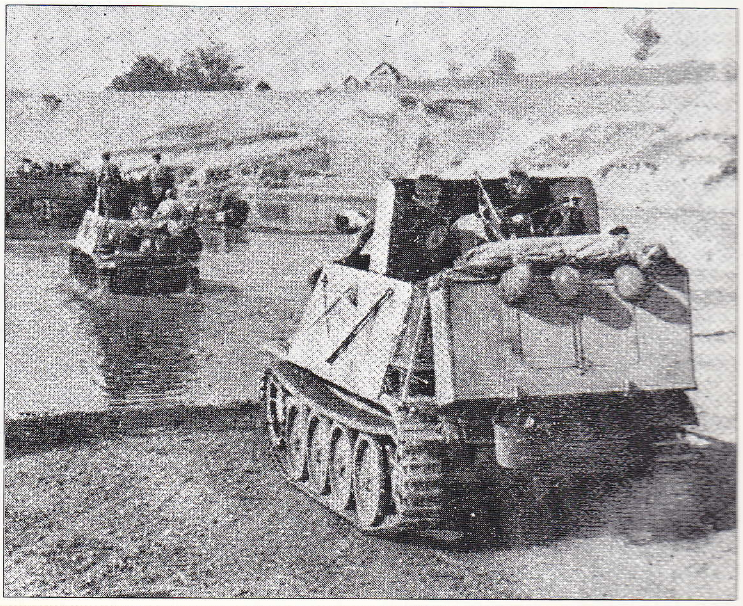
The SdKfz 184 Elefant (or Ferdinand) was first used in action at Kursk in 1943 and was a failure, as it carried no secondary armament and was thus vulnerable to Soviet tank-killer squads. Although it was meant to be a Panzerjäger it was often used as an assault gun.



This is an SdKfz 132 PzKpfw II conversion to carry a captured Soviet 7.62-cm gun. The conversion used a new large-wheeled suspension and a new hull and was sometimes known as the Marder II. The ex-Soviet guns were fitted with Pak 40 muzzle brakes.



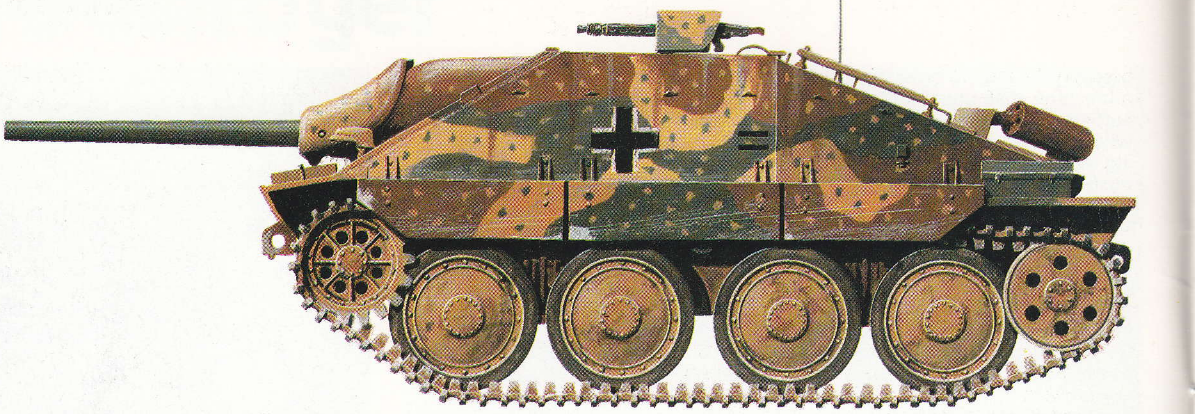
Rommel inspects a rather awkward-looking conversion of old French Hotchkiss H.39 tank chassis to carry a 7.5-cm (2.95-in) Pak 40 gun. This conversion was made in early 1944 in an attempt to provide more weapons for the defences of northern France, and about 72 conversions were produced.



These vehicles are conversions of the PzKpfw II Ausf D or E light tanks with Luchs (Lynx) suspension and captured Soviet 7.62-cm (3-in) field guns, rechambered to fire German anti-tank ammunition. They were used mainly on the Eastern Front but some were used in France during 1944.

GERMANY

Hetzer



Although tank-destroyer conversions of existing tank chassis to produce weapons such as the Marder III were moderately successful, the results were, in overall terms, high and clumsy vehicles that lacked finesse and showed every sign of the haste in which they had originally been produced. In contrast, the various Sturmgeschütz close-support artillery vehicles demonstrated on many occasions that they too could be used as tank destroyers, and thus in 1943 it was decided to produce a light Panzerjäger along Sturmgeschütz lines, the chassis of the PzKpfw 38(t) being taken as the basis.

The result was one of the best of all the German Panzerjäger: the **Jagdpanzer 38(t) für 7.5-cm Pak 39**, or **Hetzer** (baiter, as in bull-baiting). The Hetzer used the basic engine, suspension and running gear of the PzKpfw 38(t) allied to a new armoured hull that sloped inwards to provide extra protection for the crew of four. The armament was the usual 7.5-cm (2.95-in) Pak 39 modified for the vehicle, along with a roof-mounted machine-gun. Production of the new vehicle began in Prague at the end of 1943 and also involved were factories at Pilsen, Königgrätz, Böhm and Breslau. These factories were soon working flat out, for the Hetzer proved to be a very successful gun/chassis combination: it was small and low, yet it was well protected and had very good cross-country performance. The gun could knock out all but the very heaviest enemy tanks, yet the Hetzer itself was very difficult to knock out and in combat it was so small as to be virtually invisible to the enemy gunners. Calls for more and more came from the front line, to the extent that by late 1944 all available PzKpfw 38(t) production was diverted towards the Hetzer. Production continued until the factories were overrun in May 1944, by which time 1,577 had been built.

Several versions of the Hetzer were produced: one was a flamethrower, the **Flammpanzer 38(t)**, and another a light recovery version, the **Bergepanzer 38(t)**. But the Hetzer story did not cease in 1945. It was not long before the Hetzer was placed back in production for the new Czech army. The Hetzer was even exported to Switzerland between 1947 and 1952, the Swiss army using these Hetzers until the 1970s.

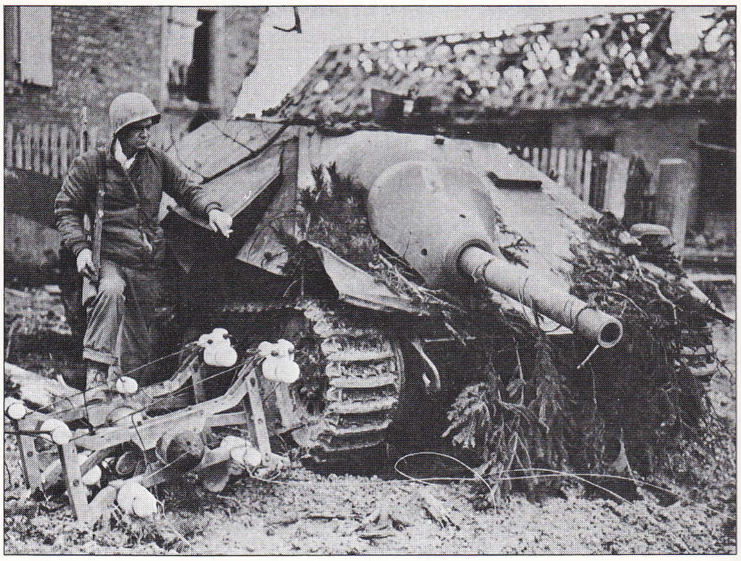
The wartime Hetzers were used for a series of trials and various weapon mountings. At one point trials were carried out with guns connected directly to the front hull armour and with no recoil mechanism fitted to see if the concept would work (it did). One trial model was an assault howitzer mounting a 15-cm (5.9-in) infantry howitzer and there were several similar projects, but none reached the production stage for the assembly lines had to concentrate on churning out more and more basic Hetzers to meet demands.

The Hetzer is now regarded as one of the best of all the German Panzerjäger for it was a powerful little vehicle that was much more economical to produce and use than many of the larger vehicles. Despite being armed with only a 75-mm gun, it could knock out nearly every tank it was likely to find and yet it was little higher than a standing man.

Specification

Hetzer
Crew: 4
Weight: 14500 kg (31,967 lb)
Powerplant: one Praga AC/2800 petrol engine developing 111.9-119.3 kW (150-160 hp)
Dimensions: length overall 6.20 m (20 ft 4.1 in) and hull 4.80 m (15 ft 9 in); width 2.50 m (8 ft 2.4 in); height 2.10 m (6 ft 10.7 in)
Performance: maximum road speed 39 km/h (24.2 mph); road range 250 km (155 miles); gradient 75 per cent; vertical obstacle 0.65 m (25.6 in); trench 1.3 m (4 ft 3.2 in); fording 0.9 m (35 in)

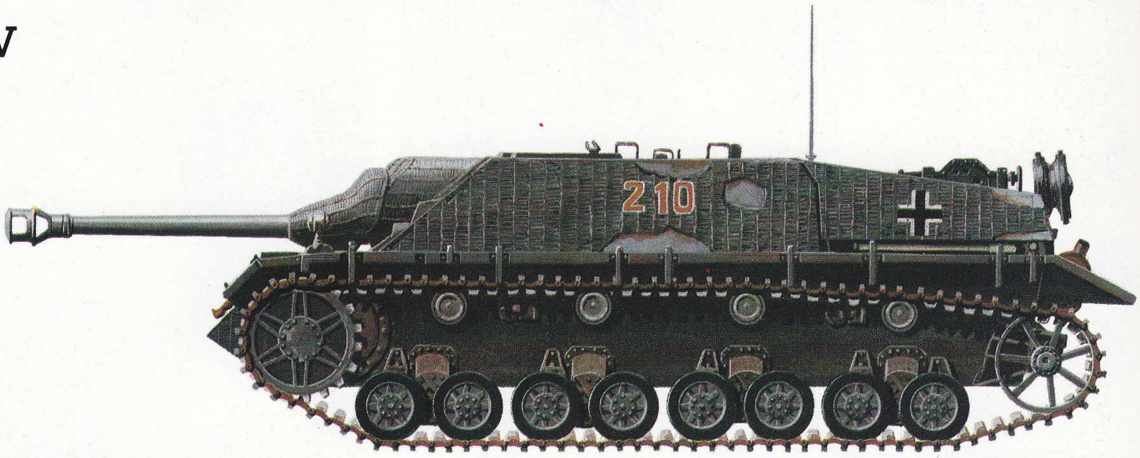
This Jadgpanzer 38(t) Hetzer has a roof-mounted remote control machine-gun for local and self-protection. The small stand-off armour side plates are fitted with the large road wheels providing more side-on protection. Well over 1,500 of these vehicles were produced.



The low height of the Hetzer can be clearly appreciated. Note the well-shaped 'Saukopf' (pig's head) gun mantlet that provided extra head-on protection and the lack of a muzzle brake, usually fitted to other German vehicles of this type.

GERMANY

Jagdpanzer IV



Combat experience gained during the 1942 campaigns indicated to German staff planners that the existing Sturmgeschütz close support artillery vehicles would have to be upgunned if they were to continue to be used as tank-destroyers, and the future standard weapon was selected as the long version of the 7.5-cm (2.95-in) tank gun fitted to the Panther tank. This gun was 70 calibres long (as opposed to the 49-calibre length of the tank and anti-tank versions of the Pak 40 family) and to house this gun in vehicles such as the Sturmgeschütz III would require considerable modifications. These modifications would take time so it was decided to adapt the larger PzKpfw IV tank chassis to act as a 'fail safe' model. Design work was soon under way on this new model, which emerged in 1943 as the **Jagdpanzer IV Ausf F für 7.5-cm Pak 39** or **Panzerjäger 39**, but by the time the first examples were ready the long 7.5-cm guns were earmarked for the Panther tanks and so the first examples had to be content with 48-calibre guns.

The first of these Jagdpanzer IVs appeared in October 1943. They consisted of the well-tried suspension and engine layout of the PzKpfw IV allied to a new armoured carapace with well-sloped sides. This hull was much lower than the hull/turret combination of the tank, and mounted the gun in a well-protected mantlet on the front hull. The result was well-liked by the Panzerjäger crews, who appreciated the low silhouette and the well-protected hull, so the Jagdpanzer IV was soon in great demand. The gun was powerful

The Jagdpanzer IV (SdKfz 162) was a Panzerjäger version of the PzKpfw IV tank and housed its 7.5-cm (2.95-in) main gun in a superstructure formed from well-sloped armoured plates. This is an early example with the guns still retaining the muzzle brake, an item later omitted.

enough to tackle virtually any enemy tank, and in action the Jagdpanzer IV was soon knocking up appreciable 'kill' totals, especially on the Eastern Front where most were sent. The secondary armament of two 7.92-mm (0.312-in) MG34 or MG42 machine-guns also proved highly effective.

Many Panzer commanders considered that the Jagdpanzer IV was good enough in its original form to require no upgunning but Hitler insisted that the change to the long gun had to be made. Thus during 1944 some **Jagdpanzer IV mit 7.5-cm Stuk 42** equipments with the longer L/70 gun appeared, but the changeover on the production line took time, too much time for Hitler, who insisted that the changeover to the new gun had to be made even if it meant diverting all PzKpfw IV tank production to that end. Thus a third Jagdpanzer IV appeared, this time a hasty conversion of a basic PzKpfw IV hull to take a form of Jagdpanzer IV sloping carapace and mounting the 70-calibre gun. This conversion was known as the **Panzer IV/70 Zwischenlösung** (interim) and was in production by late 1944.

In service the 70-calibre gun Jagdpanzer IVs proved to be powerful tank killers, but the extra weight of the long gun made the vehicles nose-heavy to the extent that the front road wheels had to be ringed with steel instead of rubber to deal with the extra weight. The gun weight also reduced the overall performance of the vehicle, especially across rough terrain. But by late 1944 and early 1945 such drawbacks simply had to be overlooked, for the Allies were at the gates of the Reich and anything that could be put into the field was used.

The Jagdpanzer IV proved to be a sound Panzerjäger that enabled the Germans to utilize existing production capacity and maintain the PzKpfw IV line in being when it would otherwise have been phased out. In service the Jagdpanzer IV was a popular vehicle and a powerful tank-killer.

Specification

Jagdpanzer IV mit 7.5-cm Stuk 42

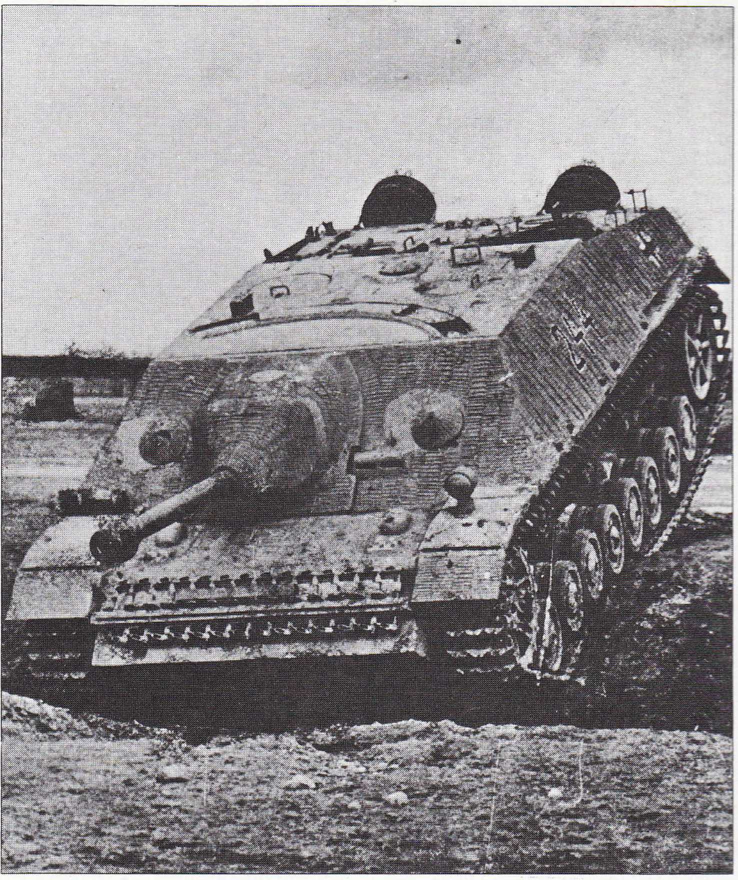
Crew: 4

Weight: 25800 kg (56,879 lb)

Powerplant: one Maybach HL 120 petrol engine developing 197.6 kW (265 hp)

Dimensions: length overall 8.58 m (28 ft 1.8 in); width 2.93 m (9 ft 7.4 in); height overall 1.96 m (6 ft 5.2 in)

Performance: maximum road speed 35 km/h (22 mph); road range 214 km (133 miles); gradient 57 per cent; vertical obstacle 0.6 m (23.6 in); trench 2.3 m (7 ft 6.6 in); fording 1.2 m (3 ft 11 in)



This early production Jagdpanzer IV has the muzzle brake still fitted. Later versions used a much longer 7.5-cm (2.95-in) main gun, but this longer gun rather overloaded the chassis, and later versions also used side armour plates. This Panzerjäger was later considered to be one of the best of its type.

GERMANY

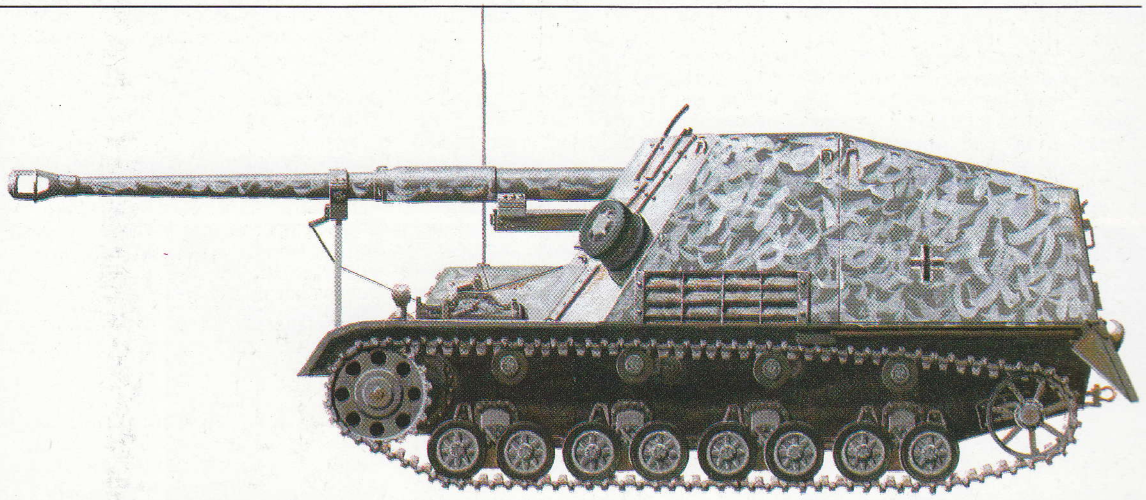
Nashorn

During the mid-war years the German army carried out a large number of hurried improvisations in order to get useful numbers of Panzerjäger into the field, and some of these improvisations fared better than others. One of these hasty measures was the adoption of the special weapon-carrier vehicle that had originally been produced to carry the large 15-cm (5.9-in) sFH 18 field howitzer and known as the Geschützwagen III/IV as it was based on the chassis of the PzKpfw IV but used some of the drive components of the PzKpfw III. Despite the great demand for the artillery version of this weapon carrier it was decided to adapt it to carry the large 8.8-cm (3.46-in) Pak 43 anti-tank gun as the **8.8-cm Pak 43/1 auf GW III/IV**. The first of these new Panzerjäger were issued during 1943, and the type went under two names: the official name was **Nashorn** (rhinoceros) but **Hornisse** (hornet) was also widely applied.

The Nashorn was very much one of the 'interim' Panzerjäger designs, for although the gun was mounted behind armour at the front and sides this armour was relatively thin, and the top and rear were open. The gun mounting itself was rather high, so the Nashorn had definite combat deficiencies, not the least of which was the problem of concealing the height and bulk of the vehicle on a battlefield. As the chassis had been intended as an artillery carrier the bulk problem was originally of little moment, but for a Panzerjäger it was of considerable importance, making the stalking of tank targets very difficult. Thus the Nashorn was often used as a 'stand-off' weapon that was able to use the considerable power and long-range accuracy of its gun to pick off targets at ranges of 2000 m (2,187 yards) and more; most of the other Panzerjäger types fought at much closer combat ranges.

The Nashorn carried a crew of five with only the driver under complete armoured protection. The rest of the crew was carried in the open fighting compartment with only a canvas cover to protect it from the elements. Most of the 40 rounds carried were located in lockers along the sides of the open compartment and the gunner was equipped not only with the usual direct vision sighting devices but also with artillery dial sights for the occasions when the Pak 43 could be used as a long-range artillery weapon. During the latter stages of production the Pak 43 gun was replaced by the similar 8.8-cm Pak 43/41, a weapon introduced to speed up production of the Pak 43; although it was manufactured differently from the original it was identical as far as ballistics were concerned. The Nashorn carried a machine-gun for local defence and the crew was supposed to be issued with at least two sub-machine guns.

Most Nashorn production was centred at the Deutsche Eisenwerke, at Teplitz-Schönau and Duisburg, and by the time the last of the vehicles rolled off the lines during 1944 473 had been made. In combat the powerful gun made the Nashorn a potent vehicle/weapon combination, but it was really too high and bulky for the Panzerjäger role and only a shortage of anything better at the time maintained the type in production. As it was it was succeeded by the Jagdpanther.



The SdKfz 164 Hornisse was the first Panzerjäger to mount the 8.8-cm (3.46-in) Pak 43/1, and used the same chassis as the Hummel.

Specification

Nashorn

Crew: 5

Weight: 24400 kg (53,793 lb)

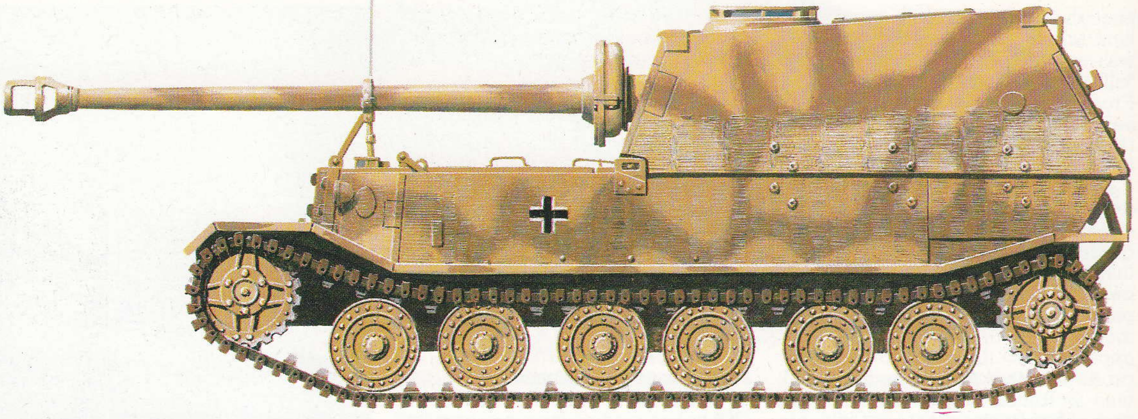
Powerplant: one Maybach HL 120 petrol engine developing 197.6 kW (265 hp)

Dimensions: length overall 8.44 m (27 ft 8.3 in) and hull 5.80 m (19 ft 0.3 in); width 2.86 m (9 ft 4.6 in); height 2.65 m (8 ft 8.3 in)

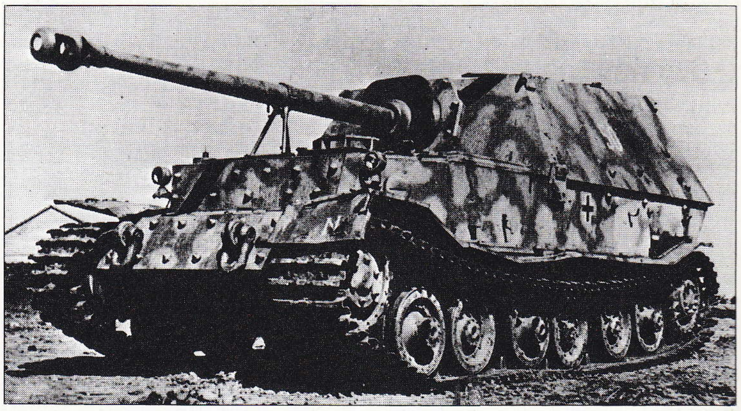
Performance: maximum road speed 40 km/h (24.8 mph); range 210 km (130.5 miles); gradient 57 per cent; vertical obstacle 0.6 m (23.6 in); trench 2.3 m (7 ft 6.6 in); fording 0.8 m (2 ft 7.5 in)

GERMANY

Panzerjäger Tiger (P) Elefant



Above: The Elefant used a complex twin-engine power pack driving an electric transmisison that did not work too well in service. It was heavy, slow and ponderous, making it more of a heavy assault gun than a Panzerjäger. Most were used in Russia but a few ended up in Italy in 1944.



The Elefant was one of the failures of the German Panzerjäger designers, for despite its main 8.8-cm (3.46-in) gun it was too cumbersome and, more importantly, the first examples lacked any kind of self-defence armament. It was also too complicated and was generally unreliable.

When the tank that was to become the Tiger was still in its planning stage two concerns, Henschel and Porsche, were in competition for the production contract. The Porsche entry was at one time the more favoured, mainly as a result of Professsor Porsche's influence with Hitler, but also because the design featured a radical approach by employing a petrol-electric drive with electric motors actually propelling the vehicle. However, the Porsche approach proved to be unreliable on test and the Henschel entry went on to become the PzKpfw VI Tiger.

But by the time the Henschel design was in production, Porsche drives and the hulls to put them in were also ready for production. It was then decided to place the Porsche design in production for use as a heavy tank-destroyer mounting the new 8.8-cm (3.46-in) Pak 43/2 anti-tank gun, a development of the earlier Flak 18-37 anti-aircraft gun series. (Actually the Pak 43 was virtually a new gun and fired more powerful ammunition than the earlier guns.) The gun would be placed in a large armoured superstructure with limited traverse, and 90 of these vehicles were produced to become the **Panzerjäger Tiger (P)**, later known as either **Ferdinand** or **Elefant**. The (P) denoted Porsche.

The Elefants were produced at the Nibelungwerke in something of a hurry during early 1943, the urgency being occasioned by the fact that Hitler demanded them to be ready for the opening of the main campaign of 1943, which was to commence against the Kursk salient on the Eastern Front; the new Panther tanks were also scheduled to make their combat debut in the same battle. Production delays and training the Panzertruppen to use their new charges delayed the start of the offensive until 5 July 1943.

By then the Red Army was more than ready for them. The defences of the Kursk salient were formidable and the delays had enabled the Red Army to add to their effectiveness in depth so that when the Germans attacked their efforts were of little avail. For the Elefants the Kursk battles were a dreadful baptism of fire. The Elefants were organized in two battalions (*Abteilungen*) of Panzerregiment 654, and even before going into action their troubles began. The Elefants had been rushed into use before their many technical bugs had been entirely removed, and many broke down as soon as they started to move forward. Those that did make it to the Soviet lines were soon in trouble, for although the vehicles were fitted with the most powerful anti-tank guns then available they lacked any form of secondary armament for self-defence. Soviet tank-killer infantry squads swarmed all over them and placed charges that either blew off their tracks or otherwise disabled them. The Elefant crews had no way of defending themselves at all and those that could either withdrew or abandoned their vehicles and ran.

Some Elefants did survive Kursk and were later fitted with machine-guns to defend themselves, but the Elefant never recovered from its inauspicious debut. The few that were left were withdrawn to other fronts such as Italy but even there their unreliability and lack of spares soon rendered them useless. Some were captured by the Allies in Italy.

Specification

Elefant

Crew: 6

Weight: 65000 kg (143,300 lb)

Powerplant: two Maybach HL 120 TRM V-12 petrol engines each developing 395.2 kW (530 hp) and driving a Porche/Siemens-Schuckert petrol-electric drive

Dimensions: length overall 8.128 m (26 ft 8 in); width 3.378 m (11 ft 1 in); height 2.997 m (9 ft 10 in)

Performance: maximum road speed 20.1 km/h (12.5 mph); road range 153 km (95 miles); gradient 40 per cent; vertical obstacle 0.8 m (31.5 in); trench 2.65 m (8 ft 8.3 in); fording 1.0 m (3 ft 3.4 in)

GERMANY

Jagdpanther

When the vehicle now known as the **Jagdpanther** was first produced in February 1944, it marked a definite shift away from a period where Panzerjäger were hasty conversions or improvisations to a point where the tank-destroyer became a purpose-built weapon of war. The Jagdpanther was first mooted in early 1943, at a time when tank destroyers were required in quantity, and by taking the best available tank chassis it was hoped that production totals would meet demand. Thus the Panther chassis was used virtually unaltered as the basis for the new Panzerjäger, and an 8.8-cm (3.46-in) Pak 43 anti-tank gun was mounted on a well-sloped armoured hull superstructure, with a 7.92-mm (0.312-in) MG34 or MG42 machine-gun for local defence. The prototype, then known as the **Panzerjäger Panther**, was demonstrated to Hitler in October 1943 and it was Hitler himself who decreed that the name should be changed to Jagdpanther.

The Jagdpanther was one of those vehicles where superlatives could be justifiably lavished, for it was a superb fighting vehicle and destined to be one of the most famous of all the many World War II armoured fighting vehicles. It was fast and well protected, and it mounted a potent gun, but not content with all that it had about it a definite aura that distinguished it from all its contemporaries. So well balanced was the design that it would not be too out of place in any tank park today, 40 years after it first appeared. The Jagdpanther could knock out virtually any enemy tank, including the heavy Soviet IS-2s, although for them a side shot was required for a certain kill. At times single Jagdpanthers or small groups of them could hold up Allied armoured advances for considerable periods. Fortunately for the Allies, production of the Jagdpanther never reached the planned rate of 150 per month. By the time the production facilities were overrun during April 1945 only 382 had been completed, a fact for which Allied tank crews must have been very grateful. The main cause of these low production totals was the disruption and damage caused by Allied bomber raids on the two main centres of production, the MIAG plant at Braunschweig and the Brandenburg Eisenwerk Kirchmöser at Brandenburg. These disruptions led to their being several variations of Jagdpanther in use. Some had large bolted-on gun mantlets while others had much smaller mantlet collars. Late-production versions used guns built with the barrels in two parts to ease barrel changing when the bores became worn, and the stowage of tools and other bits and pieces on the outside also varied considerably.

The Jagdpanther had a crew of five and there was space inside the well-sloped and heavily-armoured superstructure for 60 rounds of ammunition. When the war ended plans had been made to produce a new version mounting a 12.8-cm (5.04-in) anti-tank gun, though in the event only a wooden mock-up had been built. But even with the usual 8.8-cm gun the Jagdpanther was truly a formidable tank destroyer that was much feared and respected by Allied tank crews. Few other armoured fighting vehicles of World War II achieved its unique combination of power, lethality, mobility and protection.

Specification

Jagdpanther

Crew: 5

Weight: 46000 kg (101,411 lb)

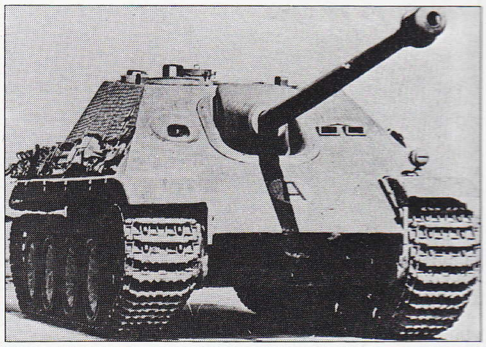
Powerplant: one Maybach HL 230 petrol engine developing 447.4-522.0 kW (600-700 hp)

Dimensions: length overall 9.90 m (32 ft 5.8 in) and hull 6.87 m (22 ft 6.5 in); width 3.27 m (10 ft 8.7 in); height 2.715 m (8 ft 10.9 in)

Performance: maximum road speed 55 km/h (34.2 mph); road range 160 km (99.4 miles); gradient 70 per cent; vertical obstacle 0.9 m (35 in); trench 1.9 m (6 ft 3 in); fording 1.7 m (5 ft 7 in)

Jagdpanther in Action

Despite the limitations of a turretless design, the Jagdpanther proved to be the most outstanding tank destroyer of the war. Well armoured, its Maybach engine still provided enough power to give vital mobility and its formidable 8.8-cm L/71 Pak 43/3 gun could defeat any Allied tank. Taking every advantage of terrain, the Jagdpanthers had to defend their positions against vastly superior numbers.



This early production Jagdpanther still used the welded gun mantlet later replaced by a bolted-on component. This example also features the first type of driver's vision blocks, later replaced by a one-piece item. These early models were produced by MIAG at Braunschweig, with the gun from Krupps.

By the time the first Jagdpanthers were issued to Panzerjäger units during early 1944, the crews had become experienced in the particular art of warfare dictated by their special anti-tank weapon platforms. The Panzerjägertruppen assigned to the new Jagdpanthers were all highly experienced men who had nearly all crewed some form of Panzerjäger in action, and some of the men involved with the new vehicles could state that they had escaped from the Elefant disaster at Kursk the year before. Their experience was to be put to good use in the months ahead, for the Jagdpanther was the very epitome of the Panzerjäger they had demanded for years.

The Panzerjäger crews had previously been asked to drive into battle on what were essentially open and lightly protected mobile gun platforms. Although the vehicles usually mounted powerful guns such as the 7.5-cm (2.95-in) Pak 40, their crews had to serve these guns with only thin armour between them and their opponents and usually with no protection or cover to the sides and rear. This lack of cover made the crews vulnerable even to small-arms fire and prone to injury from mortar and artillery projectile splinters. On the new Jagdpanther that was about to be put right, for the Jagdpanther had thick armour all round and on top as well. To add more protection, the armour was well sloped so that incoming armour-piercing projectiles would tend to be deflected away rather than continue their horizontal path. The frontal armour was 80 mm (3.15 in) thick and set at an angle of 35° from the horizontal. The massive gun mantlet, always the main target of any anti-tank gunner, was no less than 120 mm (4.72 in) thick.

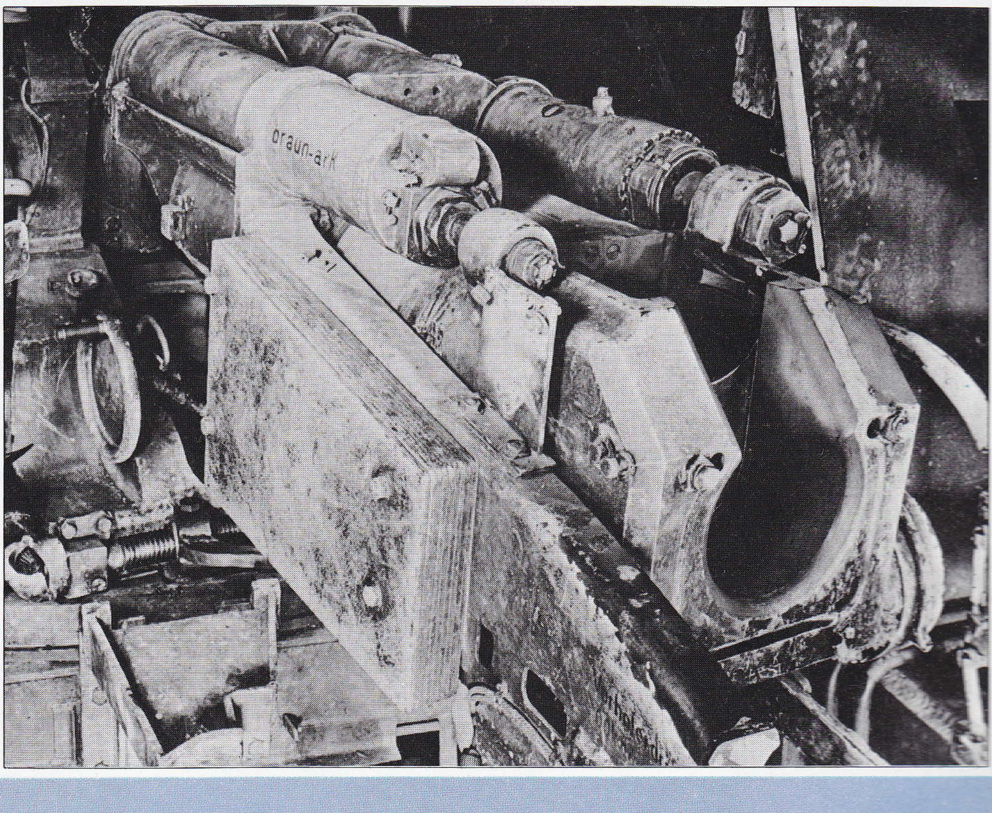
The gun was a good one. It was the 8.8-cm (3.46-in) Pak 43/3 with a barrel 71 calibres long, the same gun that was used to arm the massive Tiger II (Königstiger) battle tank. This gun was able to penetrate up to 274 mm (10.79 in) of armour with its special Panzergranate 40/43 armour-piercing projectile at a range of 500 m (547 yards), and even at 2500 m (2,734 yards) it could punch through 159 mm (6.26 in) of armour. Thus the crew would be able to knock out virtually any tank they could see on the battlefield. However, the lack of secondary armament so dearly learned by the Elefants at Kursk was not going to be repeated. On the front of the sloping front plate was a ball mounting for a 7.92-mm (0.312-in) MG34 or MG42 machine-gun to keep away enemy infantry tank-killer squads. This close-in defence was supplemented by a turret-roof fitting for a new and rather unusual defence weapon. This was known as the Nahverteidigungswaffe (literally close-in defence weapon) and projected a small high explosive charge against enemy infantry; it doubled as a defensive smoke projector.

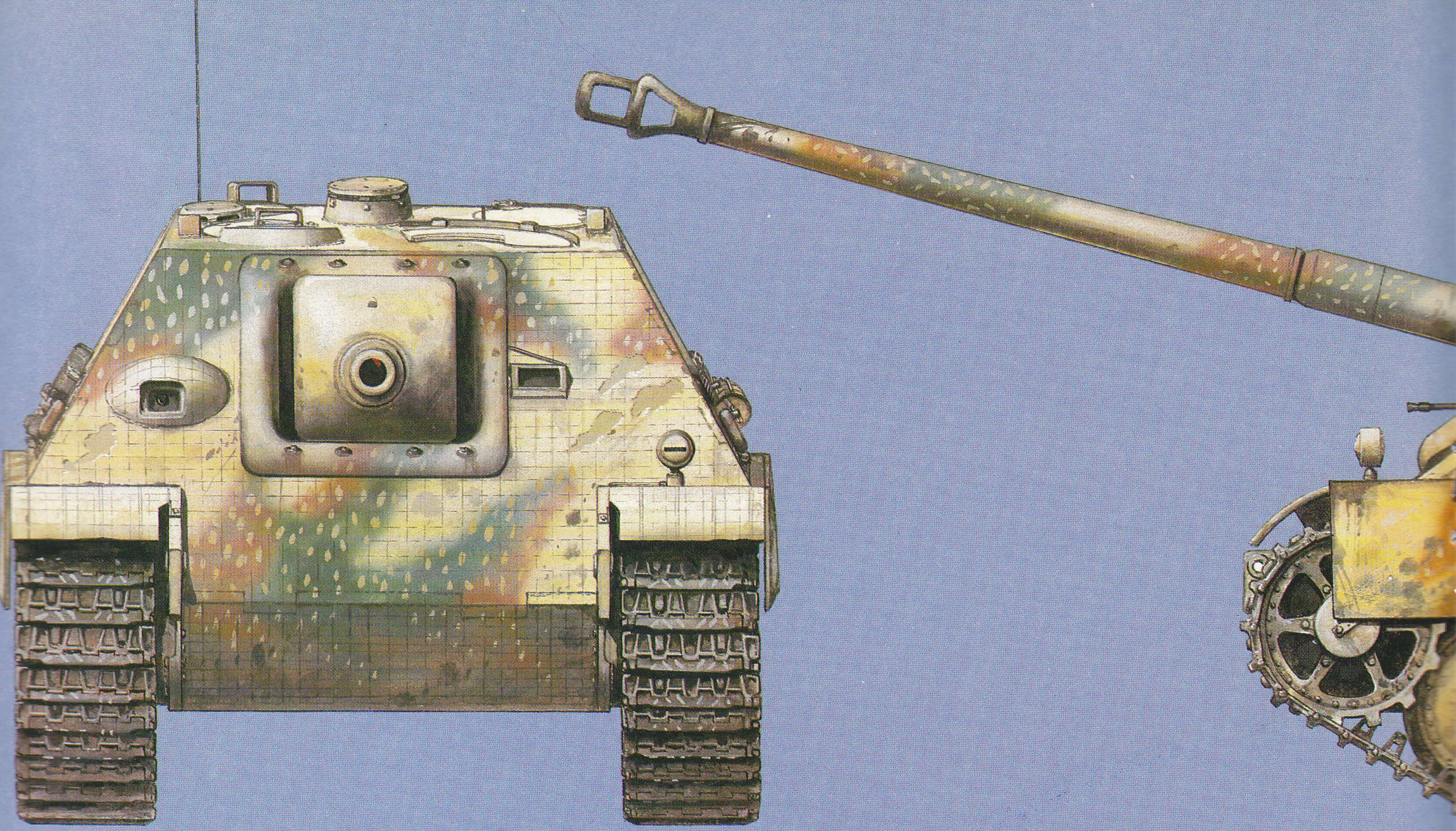
To add to their protection against the enemy tank-killer squads that had by 1944 become commonplace on every battlefield, the Jagdpanthers were often coated with a substance known as Zimmerit, a plaster-like coating that made the attachment of magnetic charges against the hull more difficult. This coating had its limitations and often flaked off after a while, but it did work against smaller magnetic charges. The side plates along each side of the vehicle were there to detonate hollow-charge warheads before they could hit the hull proper. The idea was that the thin metal sheets would cause the warhead to detonate and dissipate its lethal fire jet before it could bore its way through the main armour. Thus the plates were useful against infantry weapons such as bazookas or anti-tank grenades, but in action they were often easily knocked off or otherwise lost, so they were at best of secondary value.

Once inside the crews looked around them and liked what they saw. The interior was rather cramped, the massive breech mechanism of the Pak 43/3 and the racks for the 60 rounds of ammunition taking up much of the space, but the five men that made up the crew found that there was adequate space to work. The driver sat at the left front, while on the other side of the gun sat the wireless operator who also used the ball-mounted machine-gun. Behind them were the gunner (with his roof-mounted sighting systems) and the loader. The commander sat at the rear of the compartment under his own cupola. In the rear wall of the superstructure was the main compartment hatch through which some of the crew could enter or leave but which also doubled as a loading hatch for the long fixed-type ammunition. Inside the compartment was stowage for 600 rounds for the machine-gun. Jagdpanthers used by section or platoon commanders had extra radio installed. Externally these could be distinguished by the two radio aerials at the the rear of the superstructure.

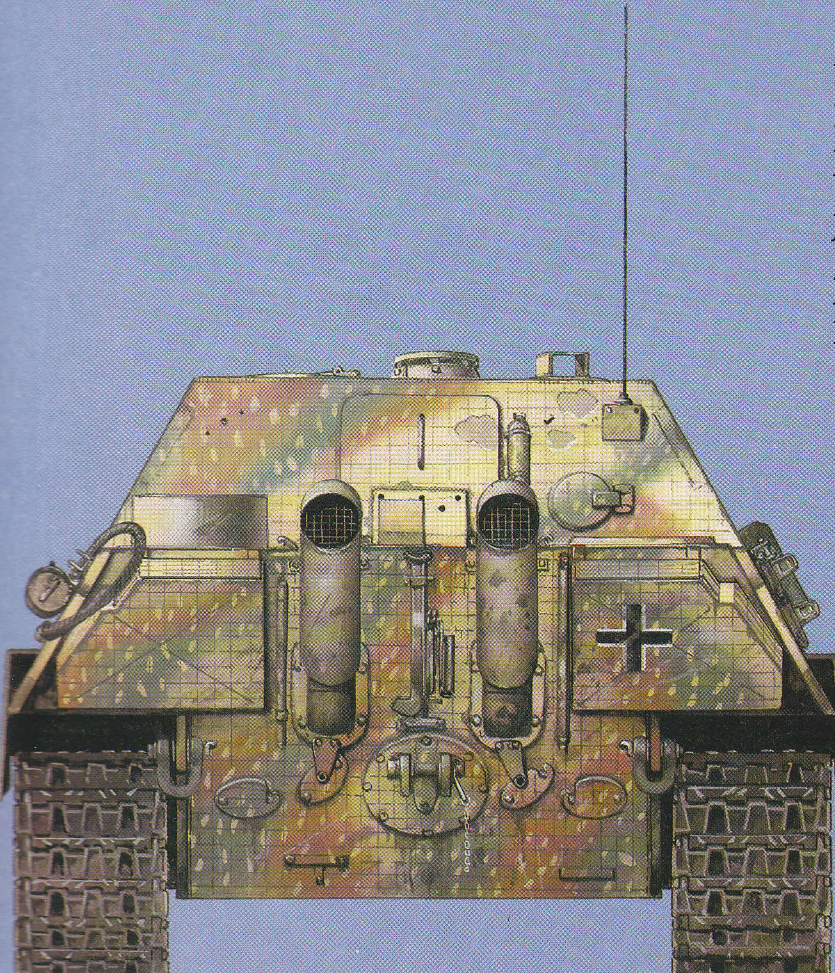
When they got a chance to drive their new Jagdpanthers, the crews were in for a pleasant surprise. Every member of the crew had to be able to drive the vehicle in case of battle casualties and they soon found that the Jagdpanther had plenty of power and that the vehicle handled well. The power came from the Maybach HL 230 P30 installed at the rear. This V-12 unit could supply adequate power at all times, and provided the Jagdpanther with a good power-to-weight ratio; and while the overall agility of the heavy Jagdpanther could never be described as spritely, it was a definite improvement over that of the many types the troops had been using before. In particular the placing of the gun well back in the sloping superstructure virtually overcame the nose-heaviness of vehicles such as the Jagdpanzer

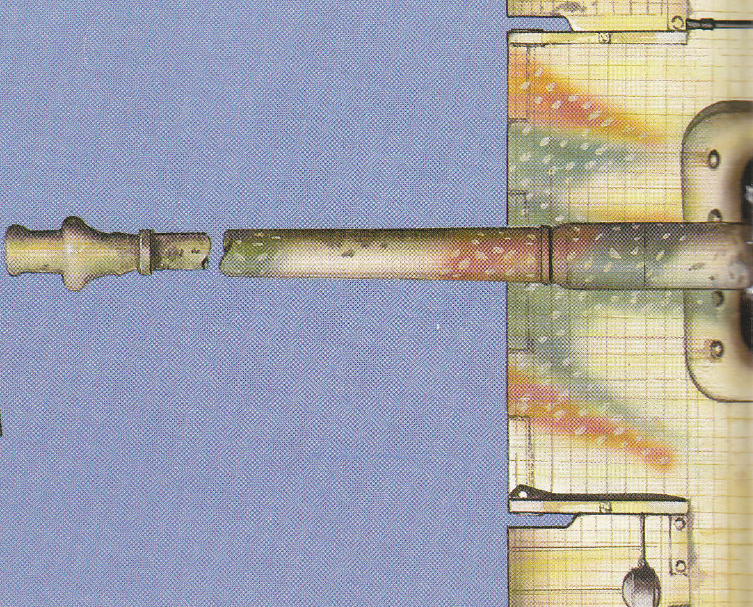
This large vertical sliding breech mechanism of the 8.8-cm (3.46-in) Pak 43/3 was carried by the Jagdpanther. The two cylinders over the mechanism are the recoil/recuperator cylinders, and the breech could close as the cartridge case was pushed into the chamber; it was ejected automatically.

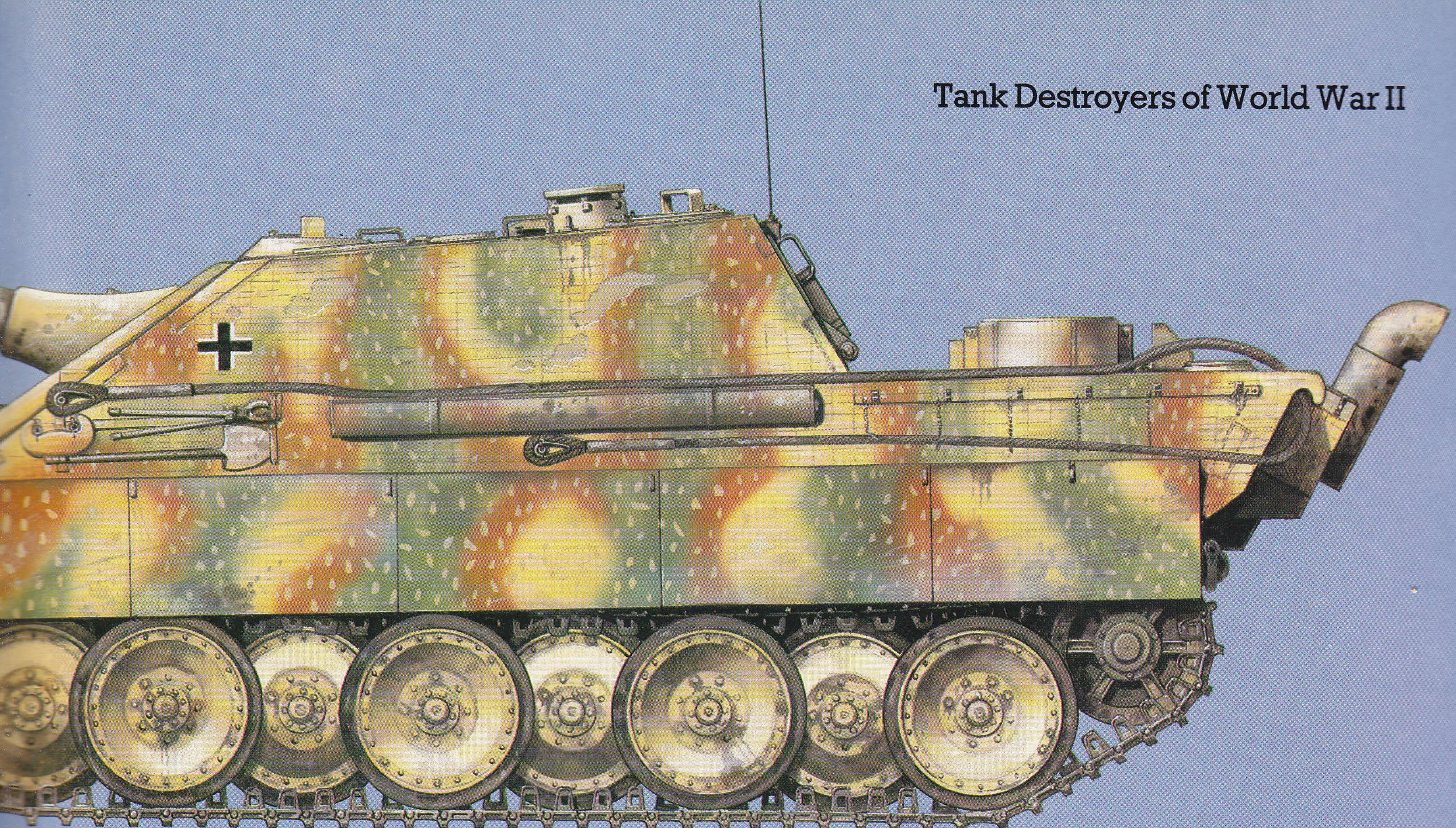




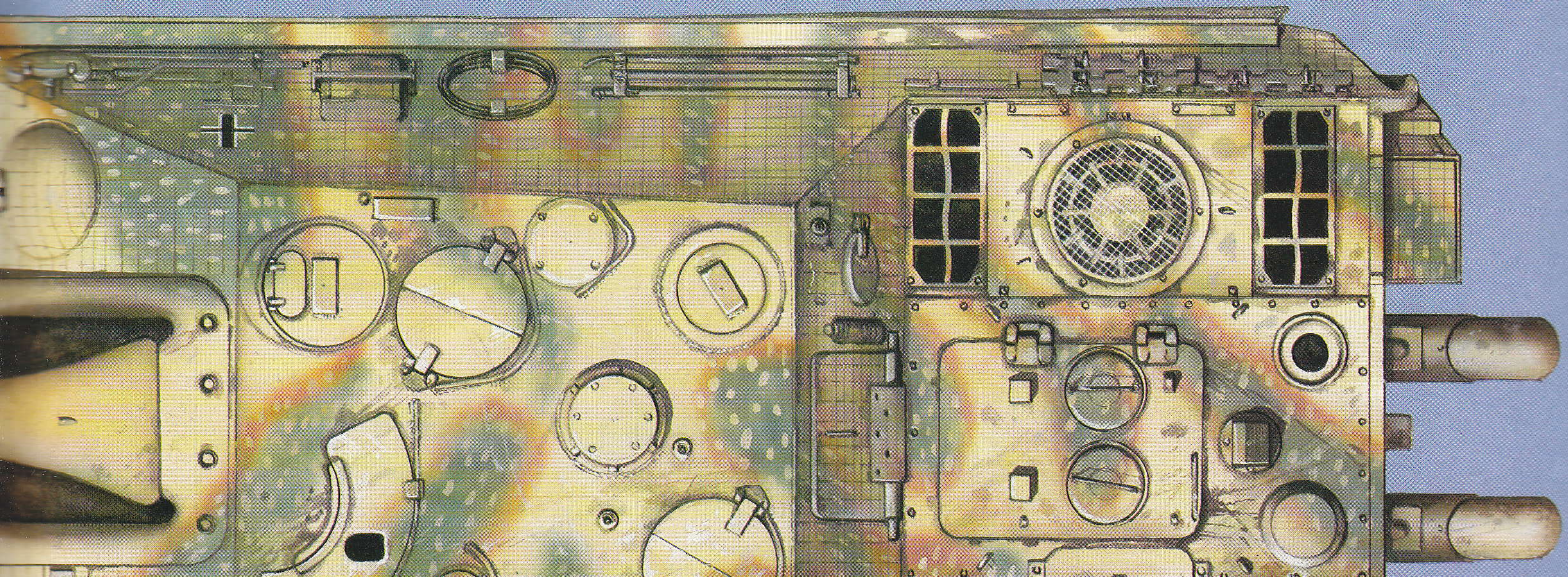
The SdKfz 173 Jadgpanther was one of the finest combat machines of World War II, and despite the overall lack of traverse for its 8.8-cm (3.46-in) Pak 43/3 main gun it was capable of defeating any Allied tank set against it. Counteracting this overall lethality, production of the Jadgpanthers was limited to a total of only 382, mainly as a result of Allied bombing campaigns. The full crew of a Jadgpanther was five, all protected within a well-armoured and well-shaped superstructure. This example is from the late production batch that used a bolted-on mantlet for the main gun. A 7.92-mm (0.312-in) machine-gun was carried.



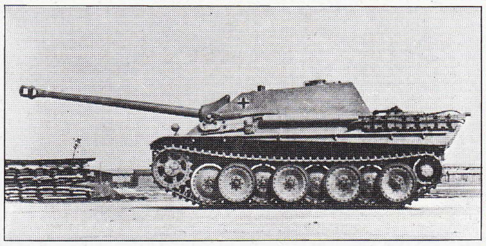




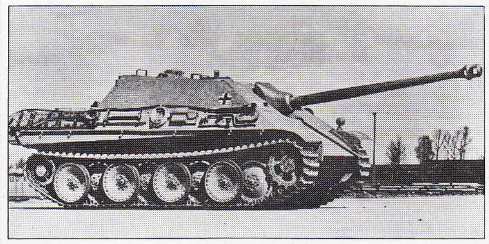
SdKfz 173 Jagdpanther



Jagdpanther in Action



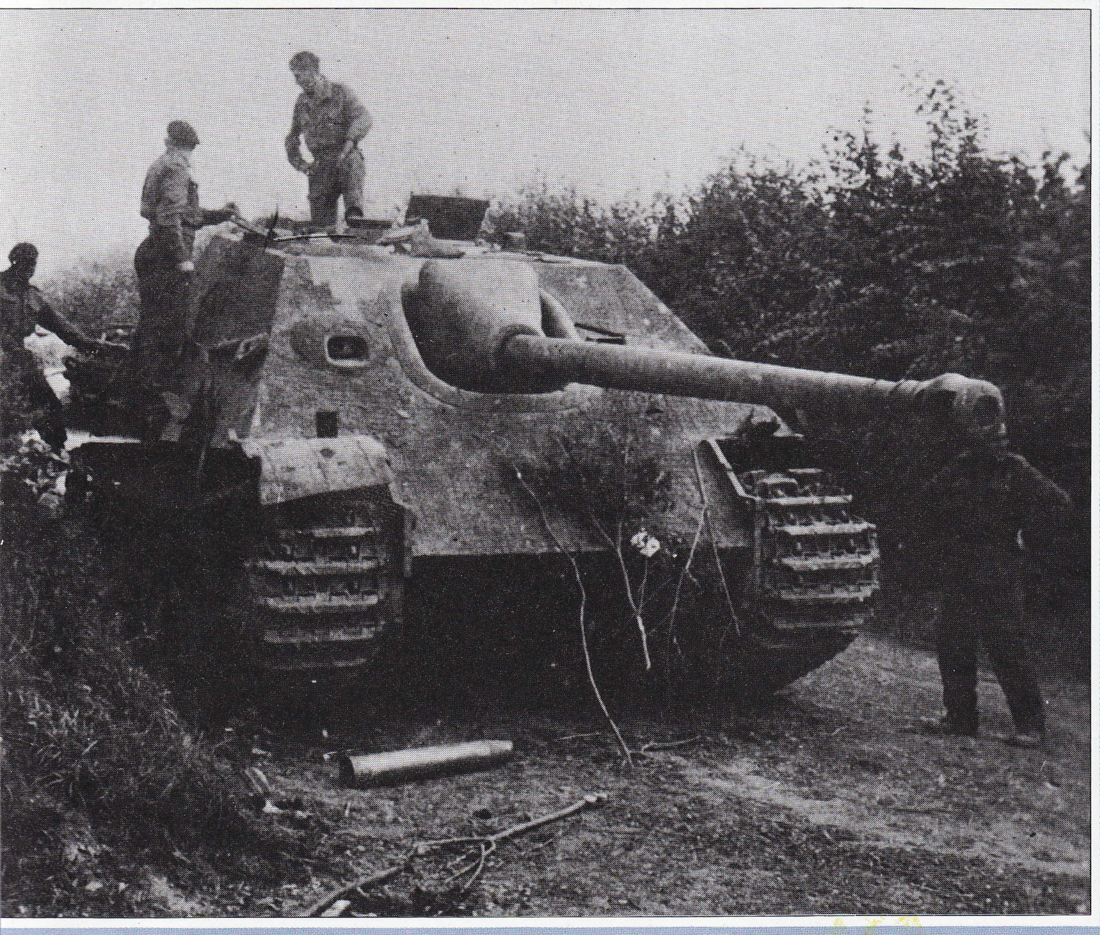
The well-sloped roof of the Jagdpanther allowed the main gun to be depressed for hull-down action when virtually all that could be seen of the vehicle was the gun. The long tube on the side of the hull housed the gun cleaning rods, and the rail for carrying extra side stand-off armour can be seen.



This Jadgpanther, straight off the production line, has its tool and other stowage intact. The superstructure is coated with Zimmerit, a substance intended to prevent magnetic charges being applied; the overlapping road wheels added extra side protection against incoming projectiles. Note the tow cable.

IV with its long L/70 gun, a tendency so severe that the type frequently got stuck even in small gullies and the front road wheels wore out after short periods in action, even when they were of all-steel construction.

The mobility of the Jagdpanther was put to good use as soon as the type went into combat. Among the very first to do so were the few that became embroiled in the fighting in Normandy following Operation 'Overlord' in June 1944. Despite the fact that they were in general outnumbered by Allied tanks, the Jagdpanthers took a fearful toll of tanks out of all proportion to their numbers. It was during this period that the Jagdpanther crews began to notice increasingly that although they frequently came out on top in combat situations, they were nearly always falling back. The reason for this was simple: the Jagdpanthers were being overwhelmed by sheer weight of numbers and matériel. No matter how many Shermans the Jagdpanthers knocked out, there were always more left for the Allies had virtually limitless stockpiles and production facilities for more. The Germans were in no such situation: every time a Jagdpanther was lost, usually by being taken in the flank from close range by a tank that escaped notice while others were engaged, it could not be replaced. There were quite simply not enough new Jagdpanthers being produced. The streams of Allied bombers that flew over the Reich day and night not only disrupted the German assembly lines but created havoc with the German internal communications network of roads, railways and canals that supplied the factories. Thus every time a Jagdpanther was issued to the Panzerjägertruppen it was an article precious beyond its monetary worth, for all too frequently if it was lost in combat there was no other vehicle to replace it.



Allied soldiers examine a knocked-out Jagdpanther. This is an early version lacking the later bolt-on mantlet around the gun barrel. Note the size of the spent propellant case in the front of the vehicle and the distinctive appearance provided by the well-sloped superstructure.

This was particularly noticeable on the Eastern Front, where the Red Army was pressing towards the border of the Reich all through 1944. On the Eastern Front there was little finesse in the fighting. Red Army advances were always heralded by massed artillery barrages and presaged by waves of T-34 tanks carrying on their backs squads of Soviet infantry. Under such circumstances a single Panzerjäger unit equipped with Jagdpanthers could hold back whole waves of Red Army tanks. From carefully concealed positions the Jagdpanthers could easily knock out the T-34s before they reached their combat ranges and if the tactical situation dictated an ambush at closer ranges the machine-guns of the Jagdpanthers could be brought into use to sweep the infantry off their carrier tanks. The problem on the Eastern Front, as elsewhere, was that all too often the Jagdpanthers had to operate in ones and twos in order to cover as much battle frontage as possible. Thus single Jagdpanthers frequently had to operate in virtual isolation from the rest of their unit, back-up being provided only by Panzergrenadiers (when they were available) or small Panzer units.

Thus to add to their own protection (and to ensure that they could fight and run away to fight another day) the Panzerjägertruppen developed some devious combat ploys. One was to conceal the Jagdpanther in ambush situations by simply driving it into a house or farm building. This was an old Panzertruppen trick, but it particularly suited the defensive Jagdpanthers, for the building structures not only provided good concealment but added to their overall protection. When the time came to move out the vehicle could be driven either backward or forward as required. Another ploy was to make as much use of the gun depression as possible. Again, this was an old 'tankie' trick, but as the gun barrel could be depressed to −8° the vehicle could be emplaced on reverse slopes with only a small amount of the vehicle visible from the front. With a little camouflage added the Jagdpanther was almost invisible and any target coming within the 22° total traverse of the gun could be engaged. It was for this reason that the roof of the Jagdpanther sloped upwards to the rear, giving the commander a good field of vision.

These were only two of the combat ploys used by the Jagdpanther crews. There were many more, for the Jagdpanthers were always given to the most experienced crews, men who had already proved their worth in combat. They had many ways of using the capabilities of their charges to the utmost and yet staying alive and retaining their vehicles to fight another day. But they were consistently outnumbered. Despite the large numbers of Allied tanks that they knocked out there were always more to come and all the time the Panzerjägertruppen were being pushed back over the borders of the Reich to their inevitable defeat. When the end came the Jagdpanthers were no longer coming off the production lines. The Allied bombers had forced them to close during April 1945, by which time some of the assembly lines had even been overrun. But right until the end the Jagdpanther crews fought on, continuing their attempts to stem the flood until they were either knocked out during combat or were simply disabled by lack of further fuel supplies.

GERMANY

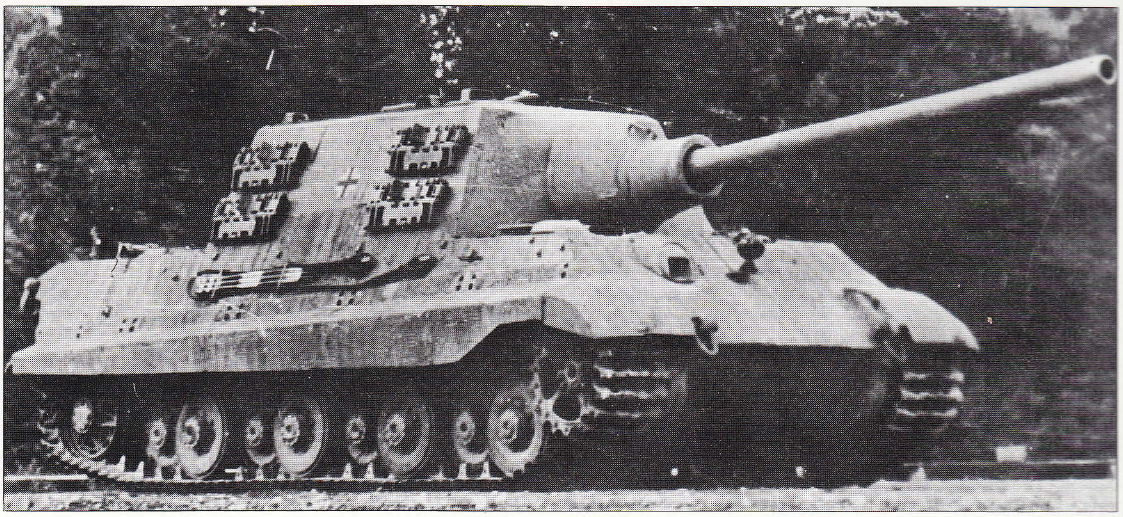
Jagdtiger

By 1943 it was an established German policy that as soon as any new tank design became available, a fixed-superstructure version mounting a limited-traverse gun would be produced. Thus when the massive Tiger II or Königstiger (King Tiger) appeared, a corresponding Panzerjäger was developed. An iron mock-up development model of this super-heavy tank destroyer appeared in October 1943, and production began during 1944 under the designation **Panzerjäger Tiger Ausf B**, more commonly known as the **Jagdtiger**.

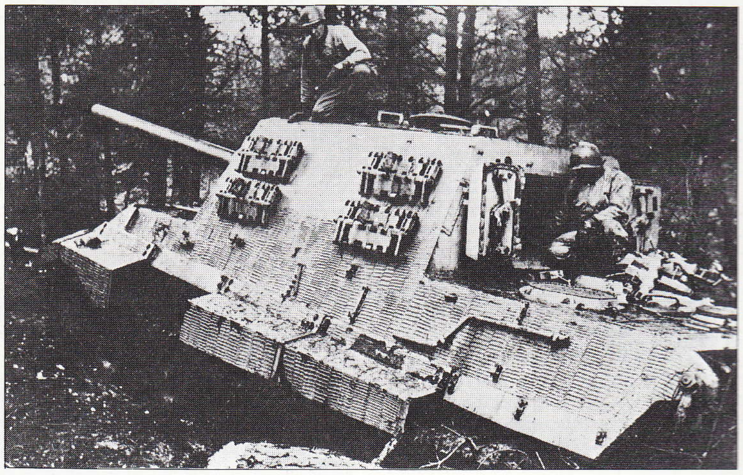
With the Jagdtiger the Germans produced the heaviest and most powerful armoured vehicle of World War II. The Jagdtiger had an official weight of no less than 70000 kg (154,324 lb) but by the time extra combat equipment and a full load of ammunition plus the crew of six had been added the weight rose to around 76000 kg (167,551 lb). Much of this weight was attributable to the armour, which was no less than 250 mm (9.84 in) thick on the front plate of the superstructure. The main armament was originally a 12.8-cm (5.04-in) Pak 44 anti-tank gun, but this was later changed to the similar Pak 80 and at one time a shortage of these guns caused by Allied bomber raids meant that the much smaller 8.8-cm (3.46-in) Pak 43/3 had to be used. The 12.8-cm guns were the most powerful anti-tank weapons used by any side during World War II, and the large size of its ammunition meant that each Jagdtiger could carry only 38 or 40 rounds. The defensive armament was two 7.92-mm (0.312-in) machine-guns.

Without a doubt the Jagdtiger was a massive and powerful vehicle as far as weapon power and protection were concerned, but in respect of mobility it could be regarded only as ponderous. It was driven by the same engine as that used in the Jagdpanther, but this engine had to drive the much greater weight of the Jagdtiger and to do this had usually to be driven full out, considerably increasing the fuel consumption and reducing range. When moving across country the Jagdtiger had a speed of only 14.5 km/h (9 mph) and often less, and the maximum possible cross-country range was only 120 km (74.5 miles). This reduced the Jagdtiger from being a true Panzerjäger to a sort of mobile defensive pillbox, but by the time the Jagdtiger was in service the Germans were fighting a defensive war so the lack of mobility was not so desperate as it once might have been.

The production line for the Jagdtiger was at the Nibelungwerk at St Valentin where total production ran to only 70 vehicles, as a result mainly of the disruption caused by Allied bombing, not only at the factories but in the raw material supply lines. By the time the war ended two types of Jagdtiger were to be encountered, one with Henschel suspension and later versions with an extra road axle and Porsche suspension. In both forms the Jagdtigers were ponderous to an extreme and although on paper they were the most heavily armed and protected of all the armoured fighting vehicles used during World War II (and for many years afterwards) they remained considerably underpowered, a fact that rendered them little more than mobile weapon platforms.



Above: Two types of suspension were used on the Jagdtiger. This example has the Henschel suspension; the other type used larger road wheels from Porsche. Based on the Tiger II tank chassis, only about 70 were produced, and it was the heaviest AFV to see service during World War II.



The massive Jagdtiger with its 128-mm (5.04-in) gun was a powerful weapon, but it was underpowered and too heavy to be anything other than a purely defensive weapon. Not many were made before the war ended, but the 250-mm (9.84-in) frontal armour made it a difficult vehicle to knock out.

Specification

Jagdtiger

Crew: 6

Weight: 76000 kg (167,551 lb)

Powerplant: one Maybach HL 230 petrol engine developing 447.4-522.0 kW (600-700 hp)

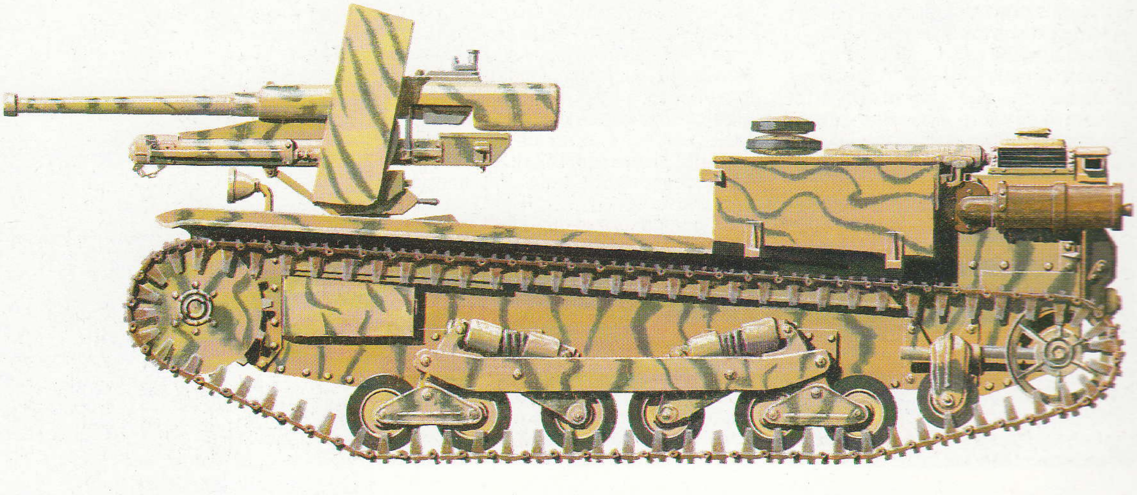
Dimensions: length overall 10.654 m (34 ft 11.4 in); width 3.625 m (11 ft 10.7 in); height 2.945 m (9 ft 8 in)

Performance: maximum speed 34.6 km/h (21.5 mph); road range 170 km (105 miles); gradient 70 per cent; vertical obstacle 0.85 m (33.5 in); trench 3.0 m (9 ft 10 in); fording 1.65 m (5 ft 5 in)

ITALY

Semovente L.40 da 47/32

During World War II the Italians were never noted for dramatic innovations as far as armoured vehicle design was concerned. However, in one aspect they were abreast of tactical thinking elsewhere for they became interested in the tank-destroyer concept during the late 1930s. At that time they produced an intriguing design known as the **Semovente L.3 da 47/32** mounting a 47-mm (1.85-in) anti-tank gun with a barrel 32 calibres long (hence 47/32). The L.3 mounted the gun on an open



The Italian Semovente L.3 da 47/32 was an early attempt to mount an anti-tank gun on a light tank chassis, and was much used for trials and various gunnery tests. It generally lacked protection and was later replaced by better designs.

Semovente L.40 da 47/32 (continued)

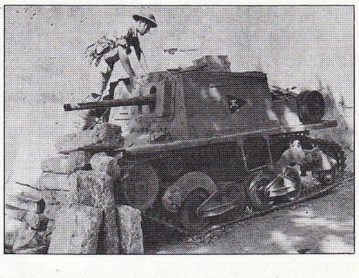
mounting at the front of a small and low chassis based on that of the L.3 tankette; a two-man crew was carried. This early project did not get far for there was virtually no protection for the crew and the idea attracted little attention.

When the Italians entered the war in 1941 they soon realized that their much-vaunted tank arm was seriously undergunned and lacked protection. This was particularlay true of their lighter tanks, in which the Italian treasury had invested to a considerable degree, especially the L.6 series that generally lacked protection and were armed only with a short 37-mm (1.456-in) gun of limited anti-armour capability. The main combat version, the L.6/40, soon proved to be of little combat value against the British armour then in use in North Africa and was obviously ripe for the usual limited-traverse anti-tank gun treatment. It was not long in coming when Fiat-SPA and Ansaldo combined to use the chassis for the basis of a tank destroyer.

The gun used for the new vehicle was the powerful 47-mm licence-built version of the Austrian Böhler dual-purpose anti-tank/infantry support gun, one of the hardest-hitting of all anti-armour weapons in its day. On the new **Semovente L.40 da 47/32** it was mounted in a simple box-like superstructure built directly onto the light tank chassis, and while this simple arrangement worked well enough the slab sides of the superstructure lacked the added protection that sloping sides would have provided. But it was better than nothing and went straight into service from 1942 onwards. In all about 280 were produced and in action they proved to be capable enough when dealing with the lighter British and other armour on the battlefields of North Africa. Ammunition stowage was 70 rounds.

When the Italians surrendered to the Allies in 1943 the Germans quickly took over as many Italian armoured vehicles and as much Italian equipment as they could. The Semovente L.40 da 47/32 was among this booty, and was quickly impressed as part of the equipment of German units fighting in Italy. However, the terrain of many of the Italian battlefields during the long slog north that lasted through 1944 and 1945 was such that armour could be used on few occasions, and the Semovente L.40s often had their anti-tank armament removed and were used instead as mobile command posts for senior commanders, with an armament of one 8-mm (0.315-in) Breda modello 38 machine-gun.

The Semovente L.40 da 47/32 may have been a simple conversion and it had little impact on enemy armour, but it did demonstrate that the Italians had absorbed the tank destroyer concept at an early stage of the war and used it as well as their limited production basis allowed.



The Semovente L.40 da 47/32 was used in some numbers by the Italian and later the German armies, and was a conversion of the L.6/40 light tank to take the powerful Italian 47-mm (1.85-in) anti-tank gun. Its box-like superstructure was later widely used to act as a mobile command post or ammunition carrier.

Specification

Semovente L.40 da 47/32

Crew: 2

Weight: 6500 kg (14,330 lb)

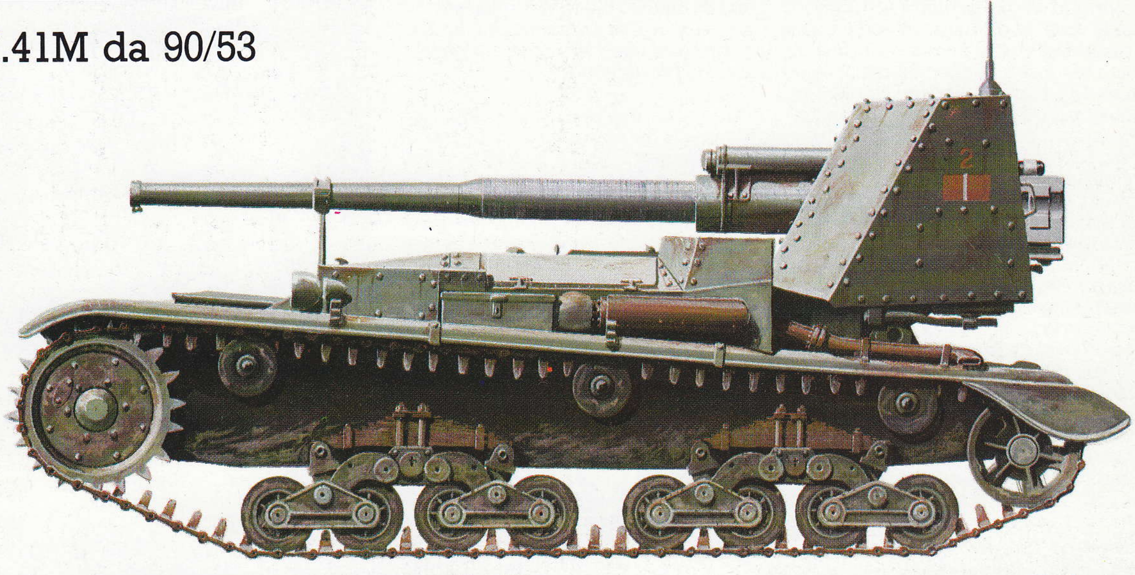
Powerplant: one SPA 18D 4-cylinder petrol engine developing 50.7 kW (68 hp)

Dimensions: length 4.00 m (13 ft 1.5 in) and hull 3.782 m (12 ft 4.9 in); width 1.92 m (6 ft 3.6 in); height 1.63 m (5 ft 4.2 in)

Performance: maximum road speed 42.3 km/h (26.3 mph); road range 200 km (124 miles); gradient 84 per cent; vertical obstacle 0.8 m (31.5 in); trench 1.7 m (5 ft 7 in); fording 0.8 m (31.5 in)

ITALY

Semovente M.41M da 90/53



The Semovente M.41M da 90/53 was the most powerful of the Italian tank destroyers, and used the 90-mm (3.54-in) anti-aircraft gun mounted on an M.15/42 tank chassis.

The Italians used the chassis of their M.13 tank as the basis for a number of self-propelled guns (Semovente), but most of them were built along the lines of the German Sturmgeschütz types and were intended for use as close-support assault artillery. At times they could be used against tanks with some degree of success, but that was not their primary function and the Italians produced only one really heavy type of tank destroyer. This was the **Semovente M.41M da 90/53**, which used the chassis of the M.14/41 tank, a development of the M.13 tank series.

The Semovente M.41M da 90/53 carried a powerful anti-armour weapon in the form of the cannone da 90/53 anti-aircraft gun, a long and very powerful weapon that had a performance very similar to that of the famous German 8.8-cm (3.46-in) Flak series. The gun's primary characteristics were denoted by the 90/53 designation, for it was a 90-mm (3.54-in) gun with a barrel 53 calibres long. To accommodate the gun mounting the engine was moved to the front of the chassis and the gun was mounted at the rear. In action two men sat on the gun mounting behind a gun shield; there was no other form of protection as the Italian approach was that such a powerful gun would not be used directly in the front line but would instead be used as a 'stand-off' weapon picking off tank targets at long ranges. No ammunition could be carried on the vehicle itself; 26 rounds were carried in a special conversion of the L.6 light tank that used a box-like superstructure very similar to that of the Semovente L.40 da 47/32, and another 40 rounds were carried in a trailer towed by the ammunition carrier. In action the long rounds were loaded into the gun breech by ammunition numbers standing on the ground behind the Semovente M.41.

After noting the power of the German 8.8-cm Flak series the Italians were quick to get their Semovente M.41M into production. The first example came off the Fiat, SPA and Ansaldo lines during 1941, but in the end only 48 were produced. The main reason for this small total was the lack of production potential within Italian industry and the ever-pressing requirements for the Cannone da 90/53 as an anti-aircraft gun. In the field the Semovente M.41M proved to be a powerful weapon, especially across the flat wastes of the North African deserts, but once that campaign ended so did the gun's career with the Italian army. Soon after the fall of Sicily and the invasion of the Italian mainland the Italians surrendered. The Germans had been expecting such a move and promptly took control of as much Italian war matériel as they could lay their hands on, and among the loot was a number of Semovente M.41Ms. The Germans soon had control of the gun's ammunition production facilities and thus the weapon ended up as part of the German army's inventory, with the type still in service in northern Italy when the war ended. By then there was little call for their tank-killing capabilities, for much of the Italian campaign took place over mountainous country where few tanks could move, so the Semovente M.41Ms were used mainly as long-range artillery.

Specification

Semovente M.41M da 90/53

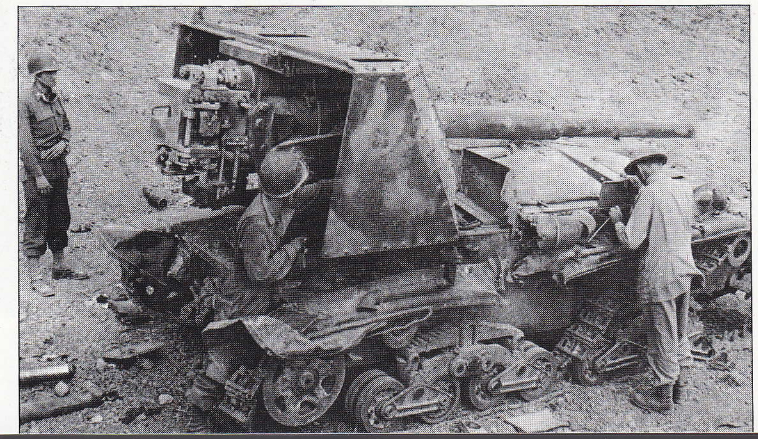
Crew: (on gun) 2

Weight: 17000 kg (37,479 lb)

Powerplant: one SPA 15-TM-41 8-cylinder petrol engine developing 108.1 kW (145 hp)

Dimensions: length 5.205 m (17 ft 0.9 in); width 2.20 m (7 ft 2.6 in); height 2.15 m (7 ft 0.6 in)

Performance: maximum road speed 35.5 km/h (22 mph); road range 200 km (124 miles); vertical obstacle 0.9 m (35.4 in); trench 2.1 m (6 ft 10.7 in); fording 1.0 m (3 ft 3 in)



A Semovente M.41M da 90/53 is examined by American troops after being knocked out in Sicily in 1943. To serve the gun, the crew had to stand behind the breech and only the driver had all-round armour. These guns were first used in North Africa in late 1943 and were much respected.

Battle of the Bulge

As the Allied armies advanced inexorably across France towards the German frontier, Hitler planned his counter-attack. Despite the proximity of the Red Army to the Prussian heartland and the pleas of his generals, the Führer insisted on attempting a repeat of his masterstroke of 1940 – an attack through the Ardennes forest.

This frame from a German propaganda film purports to show German infantry moving up past a burning Allied vehicle. Despite their initial successes that caught the Allies off guard in late December 1944, Allied air supremacy was instrumental in gaining the upper hand once the weather cleared to allow air operations.

By mid-December 1944 the main bulk of the Allied forces were concentrated (as were the attentions of the Allied high command) towards both ends of the battlefront. In the north the Anglo-Canadian armies had at last cleared Antwerp and opened the Scheldt estuary, and the US 1st and 9th Armies were set to close up to the Neder Rhine and threaten the vital Roer dams. In the south Lieutenant-General George Patton's US 3rd Army, after its spectacular drive across France, was poised to sweep through the equally important Saar region towards the Rhine at Mannheim.

Between the two powerful groupings were strung out some 80,000 American troops along 145 km (90 miles) of front, the bulk of them consisting of Major-General Troy Middleton's VIII Corps which had been brought across from Brittany, backed by one armoured division, the 9th, which had but lately arrived in the area and had not yet seen action. They were there because this part of the front, the Ardennes section, was a quiet part, covered in front by the sparsely settled German Schnee Eifel, and behind by the steep wooded hills and foaming trout streams which had always been, despite the events of 1940, regarded as unsuitable country for open warfare. Moreover, the first winter snows had fallen and heavy clouds overhead had lately kept the Allied and German air forces on the ground; both green and veteran troops crouched in their foxholes, listened to reports of bitter fighting to north and south with thoughts of thankfulness that they were not there, and dreamed of Christmas.

They were thus considerably shaken when at 05.30 on the morning of 16 December they were suddenly deluged by the heaviest artillery bombardment even the veterans among them had experienced, and when after periods varying from 20 to 90 minutes they peered out into the pre-dawn murk, they found themselves overrun by German shock troops surging forward through their positions, followed shortly by powerful Panzer and Panzergrenadier units, many of them bearing the jagged double streak of the Waffen-SS.

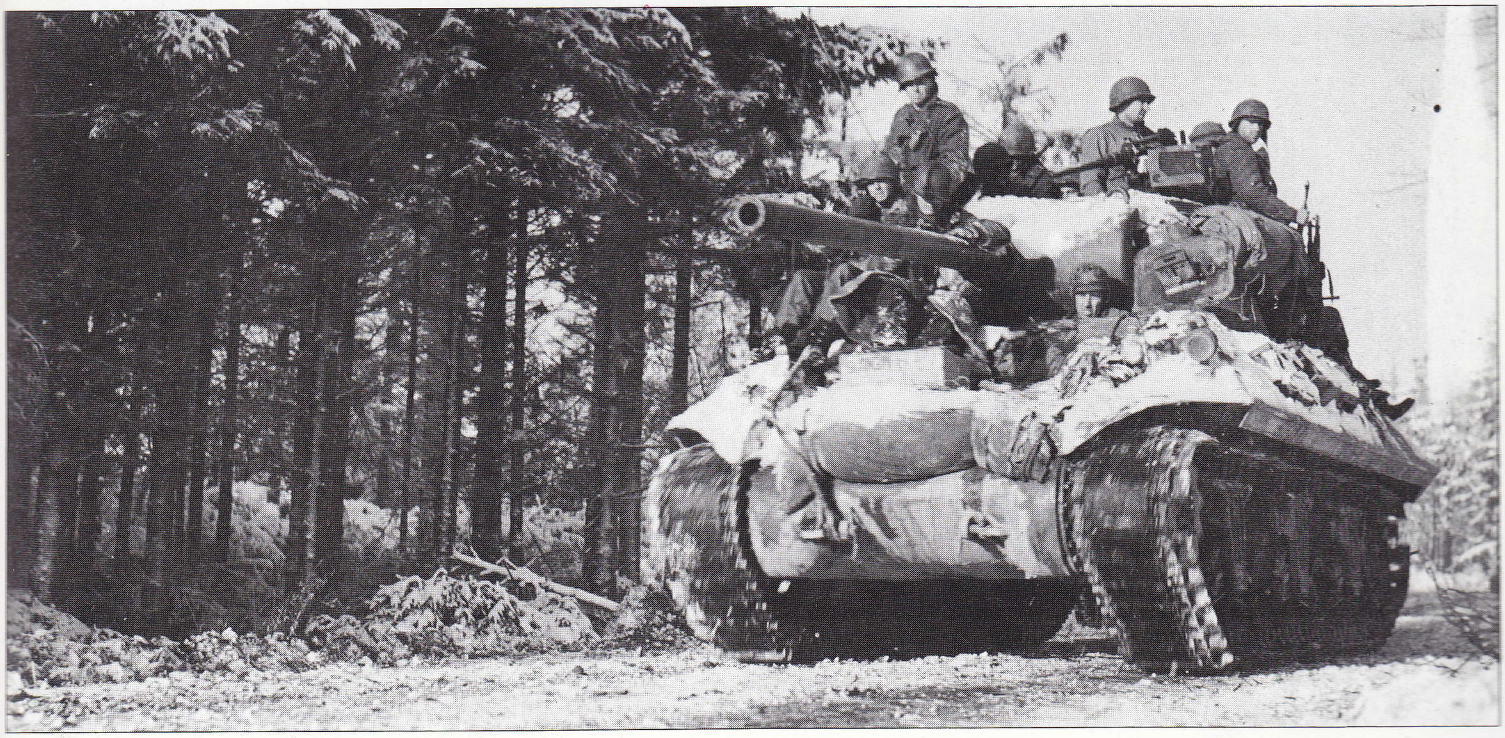
It had all been Hitler's idea, as usual at this period of the war, in direct contradiction to the advice tendered to him by the army's generals.

Even as the fighting in the Falaise Gap was ending, Hitler had announced that by November a force of some 25 divisions must be prepared to launch a huge counteroffensive against the Anglo-American armies; and to the astonishment of the German high command that force had come into existence, conjured from every corner of German life: rear-area administrative echelons, 16-year-old boys, civil servants, small shopkeepers, university students and the scourings of the prisons, all had been swept into the armed services, sometimes to join the new formations themselves, and sometimes just to release experienced men to bulk them out.

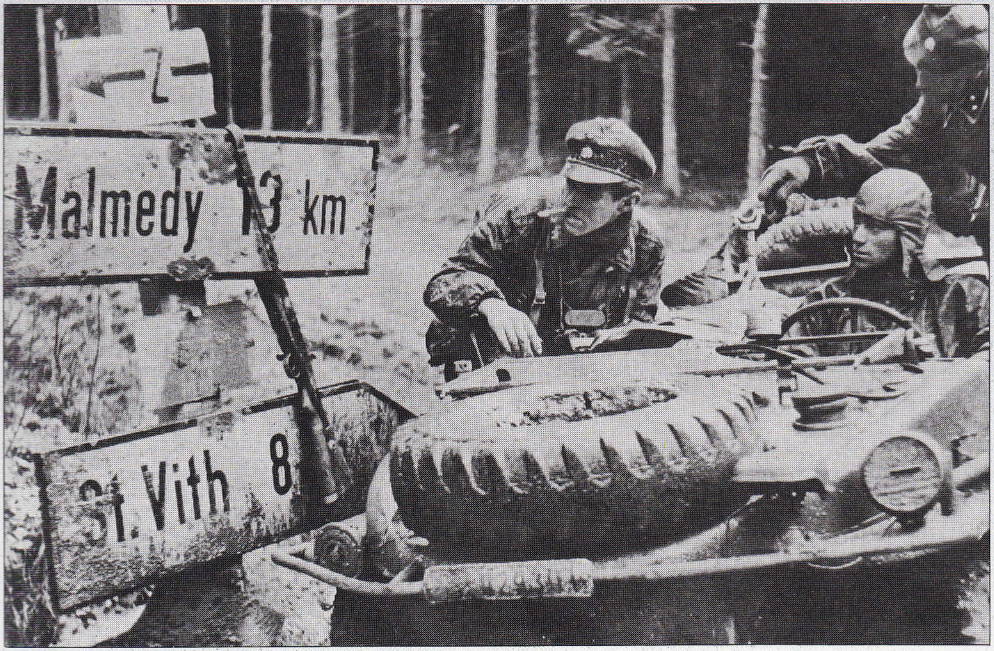
Thus had been formed three German armies, and they were by mid-December marshalled under an exemplary cloak of secrecy and subterfuge opposite that thinly occupied 145-km (90-mile) strip of line, so tenuously held by the US VIII Corps. In the north were poised the units of the 6th SS Panzer Army under Generaloberst Sepp Dietrich, erstwhile commander of Hitler's personal bodyguard in the street-fighting days and later of the crack 'Leibstandarte Adolf Hitler' 1st SS Panzer Division. In the middle section of the attack front waited the 5th Panzer Army under the trusted army General Hasso von Manteuffel. And on the southern flank of the attack to form the 'hard shoulder' against any possible northward countermove by formations of the US 3rd Army was the 7th Army under the dogged but unimaginative General Erich Brandenburger.

Altogether some 200,000 men would take part in Operation *'Wacht am Rhein'*, equipped with more tanks, more artillery and more ammunition than had been granted to any similarly assembled German force for many months past; and in addition to those more or less conventional fighting divisions, there waited in the rear 1,250 paratroops under Oberst von der Heydte, a veteran of Crete, to drop in front of the main assault, seize bridges and crossroads, and attack any headquarter organizations they could find. Moreover, to help them spread alarm and despondency, the famous raiding commander Otto Skorzeny commanded a special force of volunteers driving American vehicles and wearing American uniforms, a ploy which would result in their being shot if they fell into Allied hands.

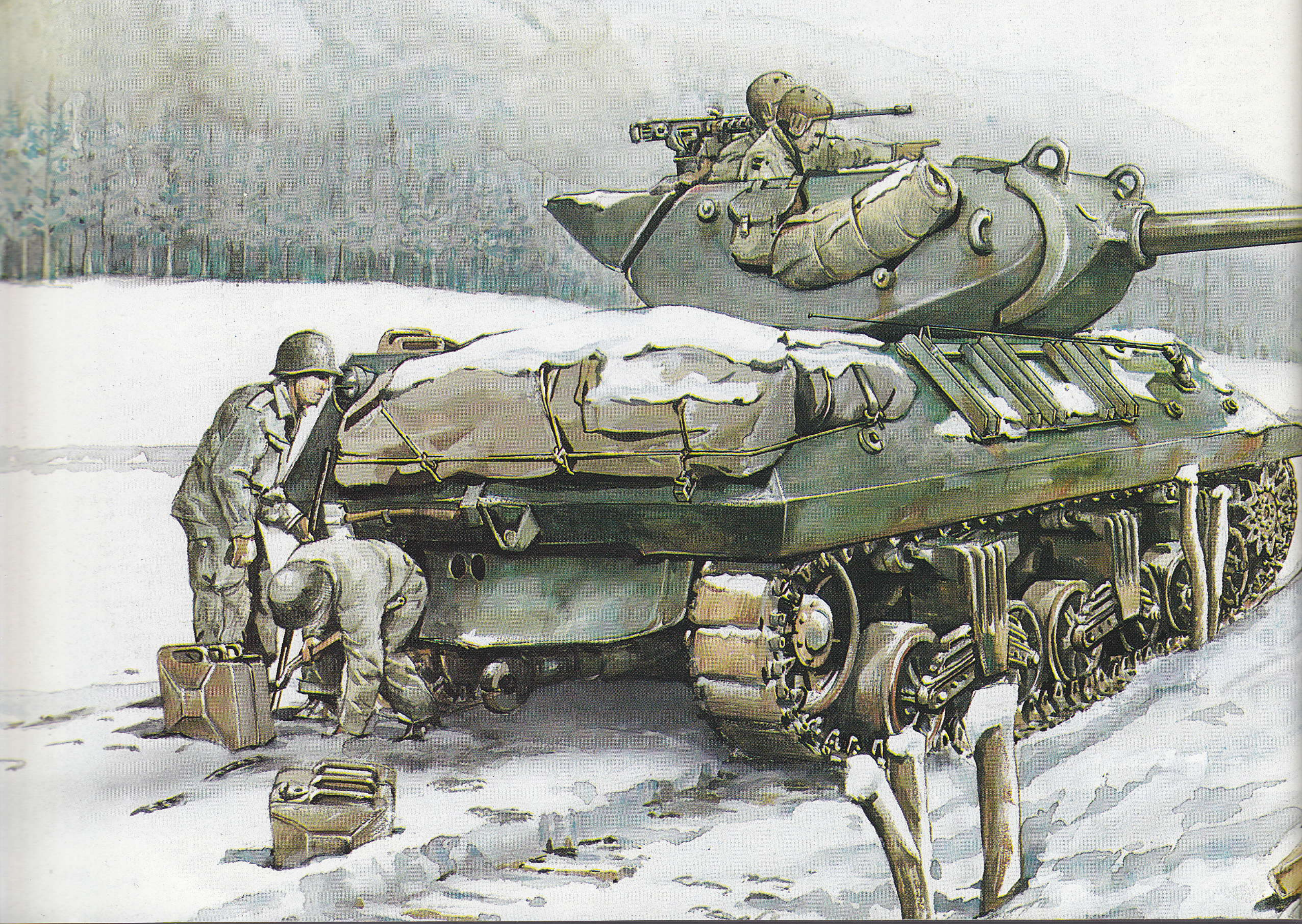
The objective for this surreptitiously assembled force was Antwerp, plus the splitting of the Allied armies threatening the German fron-



An M10 in the Ardennes. This vehicle is from the 1st Army and by that stage of the war the M10s were used less as tank destroyers and more as assault guns, for which they were not ideally suited due to their relatively thin armour. This vehicle is carrying extra passengers and is armed with a 12.7-mm (0.50-in) machine-gun.



Above: *This picture was long believed to be Oberst Peiper, the SS officer who executed US prisoners in cold blood at Malmedy. In fact it is a still from the newsreel produced by a German film unit to document the advance. The vehicle, inappropriate to the surroundings, is a Schwimmwagen amphibious scout car.*



tier, the annihilation of the Anglo-Canadian armies and the US 1st and 9th Armies alongside them by starvation as their main supply-port was captured, and an immense morale boost for the German public together with such a shock to the Allies that the consequent bickering between them would wreck their future strategic planning for weeks and possibly months.

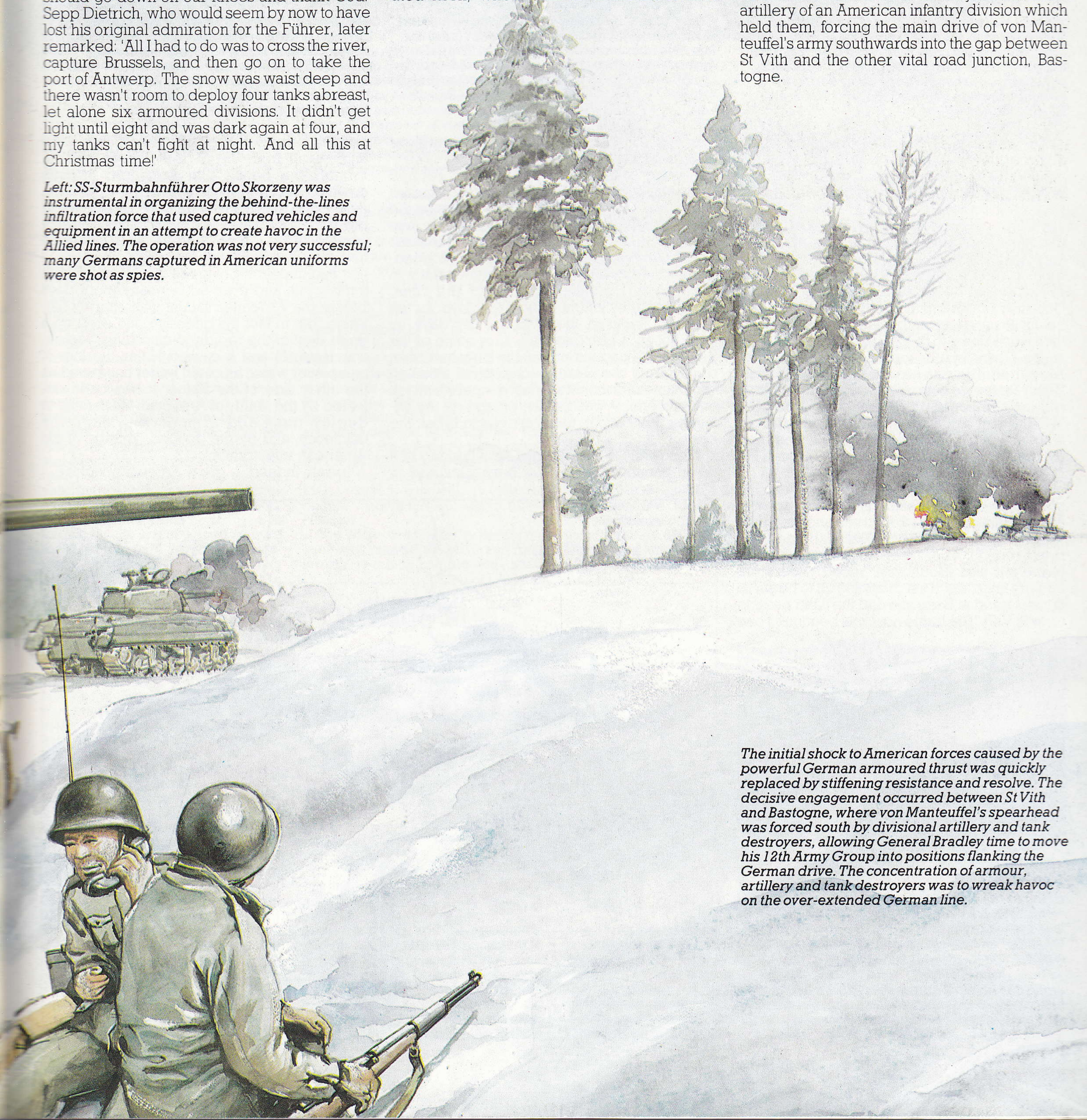
It was not regarded in this light by all the German commanders. Generalfeldmarschall Gerd von Rundstedt, whom Hitler had placed in overall command of the front, was scathing: 'Antwerp?' he cried. 'If we reach the Meuse we should go down on our knees and thank God!' Sepp Dietrich, who would seem by now to have lost his original admiration for the Führer, later remarked: 'All I had to do was to cross the river, capture Brussels, and then go on to take the port of Antwerp. The snow was waist deep and there wasn't room to deploy four tanks abreast, let alone six armoured divisions. It didn't get light until eight and was dark again at four, and my tanks can't fight at night. And all this at Christmas time!'

Left: SS-Sturmbahnführer Otto Skorzeny was instrumental in organizing the behind-the-lines infiltration force that used captured vehicles and equipment in an attempt to create havoc in the Allied lines. The operation was not very successful; many Germans captured in American uniforms were shot as spies.

Nevertheless, aided by that essential factor of surprise, some of them did very well at the beginning. Leading elements of the 1st SS Panzer Division under their ruthless commander, Oberst Peiper, swept through a gap in American lines to Honsfeld in the north, captured a large petrol dump at Bullingen and then caught American troops on the move at Malmedy crossroads before racing on towards Stavelot. Unfortunately for all parties concerned, his men, inured to the bitter fighting on the Eastern Front, shot down 19 American prisoners at Honsfeld, 50 at Bullingen and nearly 100 at Malmedy, a piece of barbarism which defeated itself; when rumour of the massacres swept through the embattled American positions it produced feelings of both fury and desperation and caused even the greenest units, sometimes commanded by only junior NCOs, to fight with a committed ferocity which baulked the important German thrust to the south.

It also spelled the almost immediate death of any of Skorzeny's men discovered at their clandestine tasks.

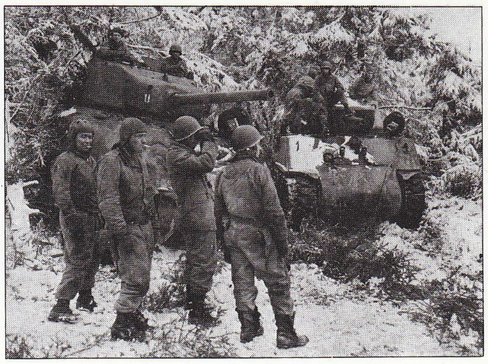
One of von Manteuffel's spearheads had success similar to Peiper's, but without that ruthlessness, and reached the village of Auw just in front of the vital road junction of St Vith, but here it ran into the tank destroyers and main artillery of an American infantry division which held them, forcing the main drive of von Manteuffel's army southwards into the gap between St Vith and the other vital road junction, Bastogne.



The initial shock to American forces caused by the powerful German armoured thrust was quickly replaced by stiffening resistance and resolve. The decisive engagement occurred between St Vith and Bastogne, where von Manteuffel's spearhead was forced south by divisional artillery and tank destroyers, allowing General Bradley time to move his 12th Army Group into positions flanking the German drive. The concentration of armour, artillery and tank destroyers was to wreak havoc on the over-extended German line.

An M10 of the American 90th Infantry Division moves through the wreckage of Berle in Luxembourg, the crew ready with their machine-guns to counter any German nests of resistance that might be around. The weather during the Ardennes campaign was bitter, and M10 crews had little cover.

Crews from M10s belonging to the 3rd Armoured Division have a brew-up during a short lull in the late 1944 operations in the Ardennes. The fire is formed from scrap timber, as American troops in the field were not as well supplied as other Allied armies.



M4 Sherman crews of the 3rd US Armoured Division of the 1st Army stand by to await developments during a lull in the Ardennes fighting. These tankies had much to do during the late 1944 fighting as it was often their mobility and firepower that halted many of the German advances and later threw them back.

And it was here that the attentions of both attackers and defenders became concentrated. It was Lieutenant-General Omar Bradley's 12th Army Group which caught the offensive in its central section, and at first Bradley wrote it off as merely a spoiling attack to disrupt the 1st Army's threat to the Roer in the north and the 3rd Army's to the Saar in the south; but he soon realized that it was more than that. On 19 December he ordered Lieutenant-General Courtney Hodges in the north to swing some of his 1st Army divisions back to hold a flank and then drive down to St Vith, and Patton to do the same in the south and send his crack 4th Armoured Division up to relieve Bastogne. Being Patton, of course, he objected, but then suddenly cheered up. 'What the hell,' he said, 'we'll still be killing Krauts!', and with an efficiency which compels the greatest admiration he swung the bulk of his army through 90° in 48 hours.

In the meantime, General Dwight Eisenhower had released his reserves and they sped to the two vital points in every truck and jeep they could find: the 82nd and 101st Airborne Divisions, recently recovered from their battles at Nijmegen and Eindhoven, raced north from Patton's lines, the 101st dropping off to begin its famous stand at Bastogne and the 82nd passing on to St Vith. The battle now was becoming one of mobility, and that game the Americans knew how to play.

As von Manteuffel's spearheads probed farther and farther west (they never crossed the Meuse, though the 11th Panzer Division did reach nearly to Dinant) American tank destroyers and artillery shored up the flanks of the penetration while their infantry fought doggedly forward into the gaps or held on grimly in isolated positions. For most of the time, moreover, they fought without air cover, for the weather favoured the Germans for days on end. But by Christmas Day, after some of the bitterest fighting in Europe, the sting had been drawn from the German onslaught; although von Manteuffel mounted a last desperate attack on Bastogne, it was beaten off and on the following day Patton's tanks arrived to break the siege.

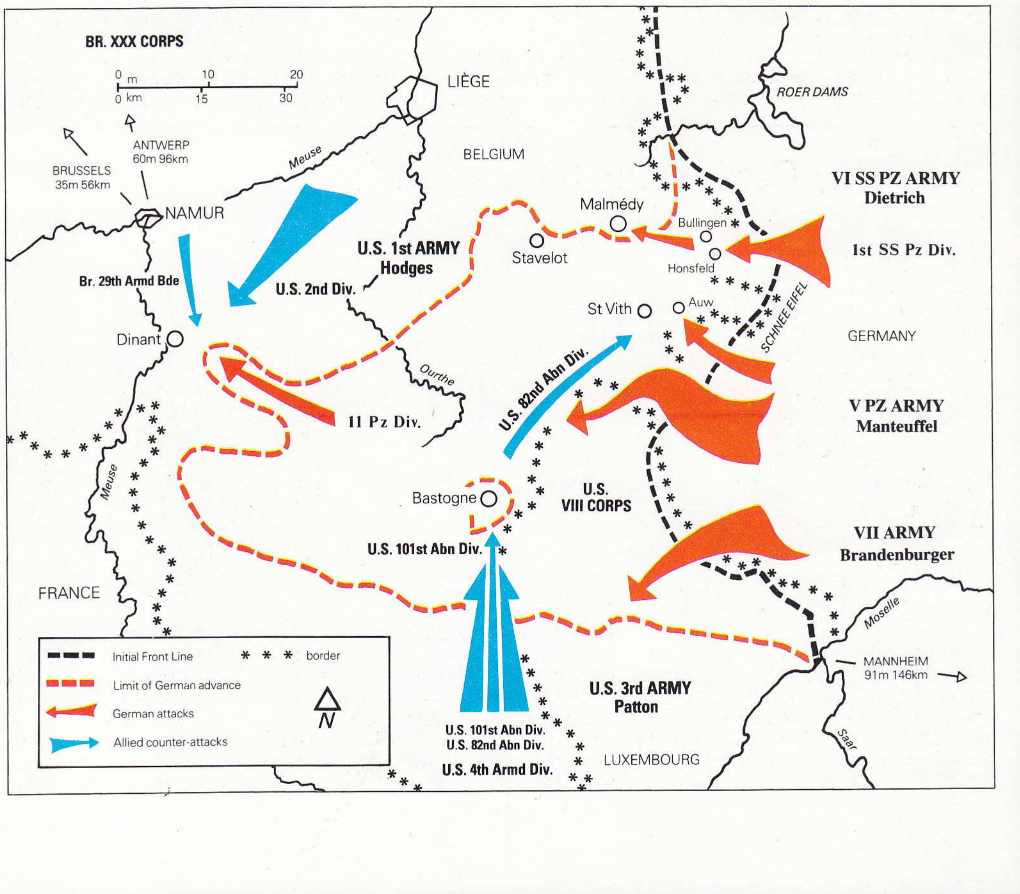
Meanwhile, Field Marshal Montgomery had taken command of the northern flank and in order to 'tidy up the battlefield' he authorized a withdrawal from the St Vith salient, and he brought the British 29th Armoured Brigade down on the Americans right flank to hold the deepest penetration; when on the following day the whole of the US 2nd Armoured Division came down to join them, Hitler's last offensive in the west was brought to a halt.

It had undoubtedly given the Allied leaders a nasty jolt, and it would be many more days before the Ardennes salient was entirely flattened, but in fact the offensive had used up a great deal of the rapidly-diminishing German war matériel and it caused Hitler the loss of manpower which he could better have used on the other side of the Rhine. It had been defeated by the ability of American leadership to deploy guns and armour with supreme efficiency, and by the dogged courage of the American infantryman.

It was, indeed, a great American victory.

Above: M10s move up to the fighting in the Ardennes and are used to carry forward infantry riding on the turrets and hulls. These same M10s would later have been used to support the infantry in action, as by the time of the Ardennes campaign the M10s were little used in their intended role of tank destroyers.

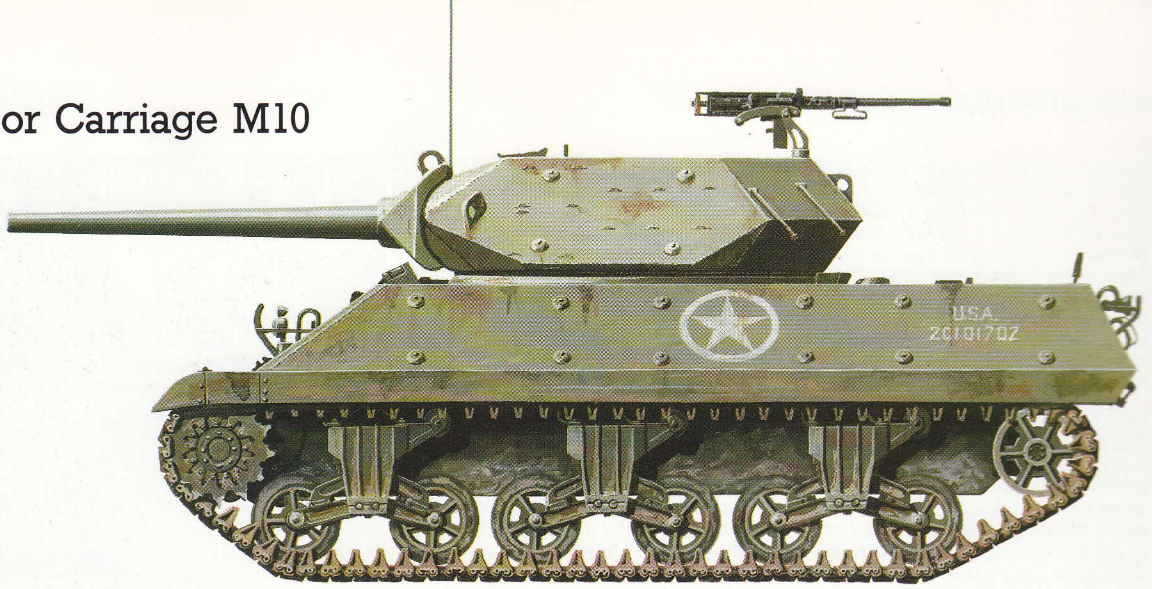
Right: The ultimate objective of Hitler's Ardennes offensive was the capture of Antwerp, but despite all the German efforts this was to prove hopelessly unrealistic.



BR. XXX CORPS
0 m 10 20
0 km 15 30
ANTWERP 60m 96km
BRUSSELS 35m 56km
NAMUR
Meuse
LIÈGE
BELGIUM
ROER DAMS
VI SS PZ ARMY
Dietrich
Malmédy
Bullingen
Stavelot
Honsfeld
1st SS Pz Div.
U.S. 1st ARMY
Hodges
U.S. 2nd Div.
Br. 29th Armd Bde
Dinant
St Vith
Auw
SCHNEE EIFEL
GERMANY
Ourthe
U.S. 82nd Abn Div.
11 Pz Div.
V PZ ARMY
Manteuffel
Meuse
Bastogne
U.S. VIII CORPS
U.S. 101st Abn Div.
VII ARMY
Brandenburger
FRANCE
Moselle
MANNHEIM 91m 146km
Initial Front Line
border
Limit of German advance
German attacks
Allied counter-attacks
N
U.S. 3rd ARMY
Patton
U.S. 101st Abn Div.
U.S. 82nd Abn Div.
U.S. 4th Armd Div.
LUXEMBOURG
Saar

USA

3-in Gun Motor Carriage M10



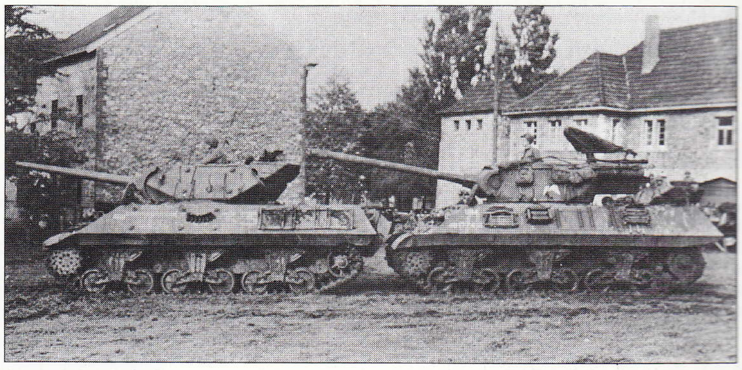
Above: The American M10 was designed to be the main weapon of the Tank Destroyer Command's mobile units, and mounted a 3-in (76.2-mm) gun in an open-topped turret. The armour protection was relatively thin, as the weight of better armour was sacrificed for all-round performance and speed once in action.

During the late 1930s and early 1940s the US Army formulated a novel tactical doctrine, whereby fast-moving armoured formations were to be countered by a new tank destroyer force comprising towed and self-propelled high-velocity anti-tank guns. This tank destroyer force was to be used en masse and was to be armed with powerful guns, and one of the first operational results of this doctrine was the **Gun Motor Carriage M10** self-propelled mounting armed with a 76.2 mm (3-in) gun known as the M7, a development of an anti-aircraft weapon. The secondary armament was one 12.7-mm (0.5-in) Browning machine-gun.

The M10 used the main chassis of the M4A2 medium tank (the Sherman) allied to a new thinly-armoured upper hull and an open-topped turret. The relatively thin armour of the hull was improved by the use of sloping armour plates to increase protection, and sloped armour was also used on the turret. Unlike many other tank destroyers of the time the M10 had a turret with 360° traverse, for although the M10 was intended for use as a tank destroyer it was seen by the US Army as a gun carrier and was not intended for close-order combat, hence the relatively thin armour. The gun was quite powerful for the period it was introduced. Production commenced during September 1942, and such was the potential of American industry that when production ceased in December 1942 4,993 had been produced.

The bulk of this total went to US Army tank destroyer battalions, and in early 1943 there were 106 active battalions. But as the war continued their number gradually decreased when it was realized that the tank destroyer concept as an arm separate from the rest of the American armoured forces was wrong and as it emerged that the best counter to a tank was another tank. But the tank destroyer force remained in being until the war ended, most of the battalions being used in Europe. By the end of the war many of the M10s and their associated equipments and towed guns were being used more as assault forces than tank destroyers. The M10 was the primary equipment of these battalions and was used not only by the US Army but by the British (who knew the M10 as the **Wolverine**) and later by the French and Italian armies. In combat the M10 proved to be less than a complete success, for despite its thin armour it was a large and bulky vehicle and as time went on the gun lost much of its anti-armour effectiveness. But the M10s were still in use when the war ended. By then the British had re-gunned many of their M10s with 17-pdr guns and re-named the type **Achilles**. The M10 had in the meantime been joined by the **M10A1**, which was the same vehicle but using the chassis of the M4A3 medium tank with its different engine installation and some other changes.

The M10s were used in battalions, each with around 36 M10s and with strong reconnaissance and anti-aircraft elements. By early 1945 most of the tank destroyer battalions were distributed among the more conventional armoured formations, and were then used exactly as other armoured formations and the exclusive tank destroyer concept died.



Late in the war the M10 (left) was supplemented by the M36 (right), which used a 90-mm (3.54-in) gun, still in an open-topped turret. The M36 was designed as early as 1942 but took a long time to get into production, so that it was late 1944 before the first of them reached Europe. By then they were mainly used as assault guns.

Specification

M10

Crew: 5

Weight: 29937 kg (66,000 lb)

Powerplant: two General Motors 6-cylinder diesel engines each developing 276.6 kW (375 hp)

Dimensions: length overall 6.83 m (22 ft 5 in); width 3.05 m (10 ft); height 2.57 m (8 ft 5 in)

Performance: maximum road speed 51 km/h (32 mph); road range 322 km (200 miles); gradient 25°; vertical obstacle 0.46 m (18 in); trench 2.26 m (7 ft 5 in); fording 0.91 m (3 ft)

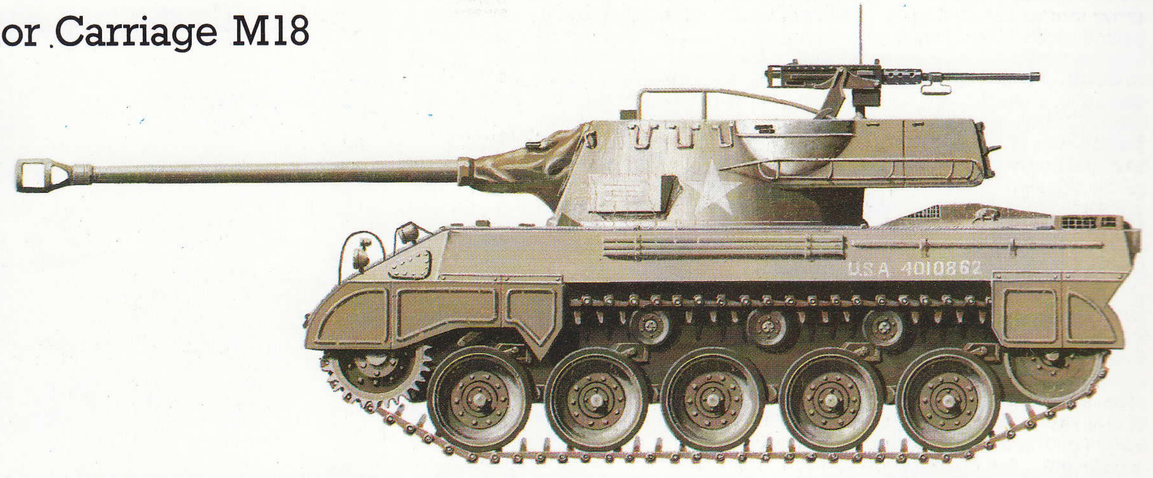
USA

3-in Gun Motor Carriage M18

Whereas the M10 was produced for the tank destroyer battalions by converting an existing tank chassis (the M4A2), the **Gun Motor Carriage M18** was designed from the outset for the tank destroyer role. Development began during 1942, and the first examples were ready during 1943.

In service the M18 proved to be one of the best examples of the American tank destroyer concept. It was much smaller than the M10 and weighed only about half as much, but it carried a more powerful gun and was much faster. Indeed, the M18 was the fastest tracked vehicle to be used in action during World War II. The gun was the 76.2-mm (3-in) M1A1 or M1A2, the latter having a muzzle brake. The M1A1 gun was a development of the gun used in the M10, but had a better all-round performance and it was mounted in an open-topped turret. In appearance the M18 resembled a tank, and it did indeed have a 360° traverse turret, but its armour protection was much less than would be expected in a tank and the M18 relied upon its mobility and striking power to defend itself. The engine was positioned to the rear of the hull and was a radial air-cooled petrol engine with aviation origins that was powerful enough to give the M18 a good power-to-weight ratio to provide the vehicle with excellent acceleration and agility. Internal stowage was such that as well as carrying the crew of five men there was space for 45 76.2-mm rounds and a 12.7-mm (0.5-in) heavy machine-gun for local and anti-aircraft defence.

In service with the tank destroyer battalions the M18 was given the name

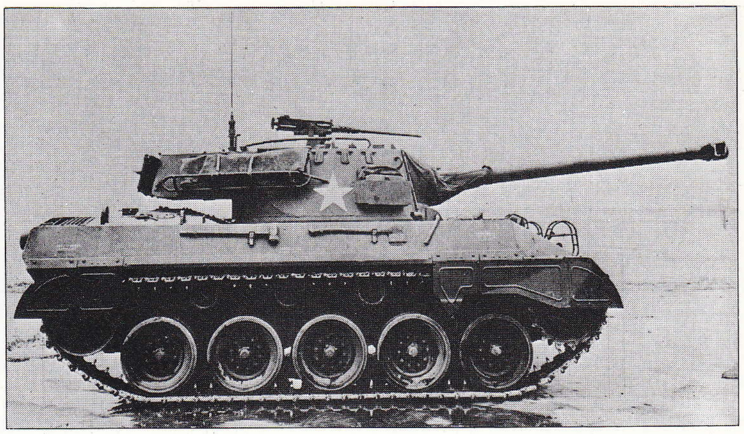


The M18 Hellcat had the distinction of being the fastest of all AFVs used during World War II. Armed with a long 76-mm (3-in) gun, it was an ideal tank-hunting vehicle, but as with other vehicles of its type it generally lacked armour and was fitted with an open-topped turret.

Hellcat. Despite their success in action the M18s were gradually switched from the tank destroyer battalions as the enthusiasm for the exclusive tank destroyer concept dwindled, and by 1945 many M18s were used by conventional armoured formations within the US Army. By then they were being used more and more as assault guns and conventional self-propelled artillery.

The production run of the M18 lasted from July 1943 to October 1944, when it was obvious that the war was not going to last much longer. Between those dates 2,507 M18s were produced, some being completed without turrets as the **M39** for use as high-speed troop or supply carriers. There was also a **T65 Flame Tank** based on the M18 with a much revised upper hull mounting a flame gun in front. The **T88 Howitzer Motor Carriage** was an attempt to mount a 105-mm (4.13-in) howitzer on the basic M18 and there were other attempts to mount a 90-mm (3.54-in) gun and turret on the chassis. None of these versions got past the experimental stage, a fate shared by many other trial versions of the basic M18 including a mobile command post, a utility carrier and an amphibious variant.

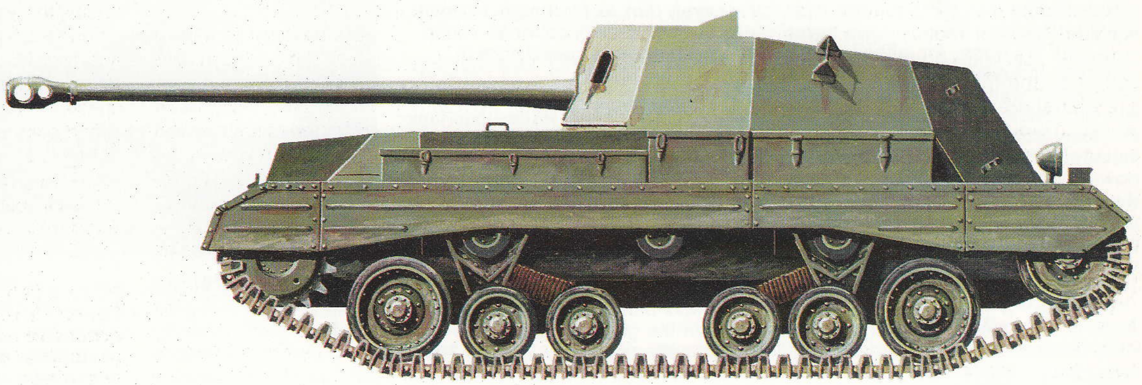
Specification
M18
Crew: 5
Weight: 17036 kg (37,557 lb)
Powerplant: one Continental R-975 C1 radial petrol engine developing 253.5 kW (340 hp)
Dimensions: length overall 6.65 m (21 ft 10 in) and hull 5.44 m (17 ft 10 in); width 2.87 m (9 ft 5 in); height 2.58 m (8 ft 5.5 in)
Performance: maximum road speed 88.5 km/h (55 mph); road range 169 km (105 miles); gradient 60 per cent; vertical obstacle 0.91 m (36 in); trench 1.88 m (6 ft 2 in); fording 1.22 m (4 ft)



M18 Hellcats went out of production in October 1944 after 2,507 had been built. The M18 was the only vehicle specifically designed for the US Army's tank destroyer role, and was a most successful combat vehicle capable of tackling all but the very heaviest German tanks.

UK

Archer



The British Archer was a conversion of the Valentine infantry tank to mount a 17-pdr (3-in/76.2-mm) anti-tank gun that fired over the rear hull. The first of them were used in action in late 1944 and proved to be very useful weapons with a low silhouette. They were used by the Royal Artillery.

Although the British army tended to lag behind the Germans in upgunning its tanks as World War II progressed, an early decision by British planners to make a quantum leap in anti-tank gun calibres from the 57 mm (2.244 in) of the 6-pdr to 76.2 mm (3 in) was a bold one, for it was made at a time when the 6-pdr was only just getting into production. It was realized that the new 76.2-mm gun, soon to be known as the 17-pdr, would be a very large and heavy weapon on its towed carriage, so it was decided to find some means of making it mobile. Ideally the 17-pdr was to be used as a tank gun, but the tanks large enough to carry such a large weapon were still a long way off (indeed had not even left the drawing boards) so a short-term alternative had to be found.

After investigating such in-production means as the Crusader tank chassis it was decided to mount the 17-pdr on the Valentine infantry tank chassis. The Valentine was in production and could be rapidly adapted for its new gun-carrying role by adding a sloping superstructure, open at the top, on the forward part of the hull. To ensure the gun/chassis combination would not be nose-heavy and unwieldy, it was decided to place the gun in a limited-traverse-mounting facing over the rear of the chassis. This vehicle was obviously meant to be a tank destroyer and it was placed in production in late 1943.

It was March 1943 before the first **SP 17-pdr Valentine** rolled off the production lines, the initial example of 800 that had been ordered. The troops looked at the new vehicle with some trepidation, for the idea of having a gun that faced to the rear only was against established practice. Drivers were also less than enchanted, for they were positioned at the centre front of the fighting compartment and the gun breech was directly behind their heads; on firing the breech block came to within a short distance of the back of the driver's head. The rest of the crew was made up of the gun layer, the commander and the loader. Protective fire could be supplied by one 7.7-mm (0.303-in) Bren gun.

It was October 1944 before the first of these Valentine/17-pdr combinations reached the fighting in Europe. By then the type had become known as the **Archer**, and in action the Archer's tank-killing capabilities were soon demonstrated. The rearward-facing gun was soon seen to be no problem, but rather a virtue. The Archer was soon in use as an ambush weapon where its low silhouette made it easy to conceal in a hide. As enemy tanks approached a few shots could be fired to kill a tank and then the Archer was facing the right way to make a quick getaway before enemy retaliation arrived. The Archers were used by the anti-tank companies of the Royal Artillery, and they were definitely preferred to the weight and bulk of the towed 17-pdr guns used by the same companies.

The end of the war brought about a halt in Archer production at a point where 655 of the original order for 800 had been produced. The Archers went on to equip British army anti-tank units until the mid-1950s.

Specification
Archer
Crew: 4
Weight: 16257 kg (35,840 lb)
Powerplant: one General Motors 6-71 6-cylinder diesel developing 143.2 kW (192 hp)
Dimensions: length overall 6.68 m (21 ft 11 in) and hull 5.54 m (18 ft 6 in); width 2.76 m (9 ft 0.5 in); height 2.25 m (7 ft 4.5 in)
Performance: maximum road speed 32.2 km/h (20 mph); road range 225 km (140 miles); gradient 32°; vertical obstacle 0.84 m (33 in); trench 2.36 m (7 ft 9 in); fording 0.91 m (3 ft)

Although the rear-facing main gun of the Archer could have been a tactical liability, the users put it to advantage by using the Archers from an ambush position and then driving away after the action with the gun barrel still pointing to the rear.

Armed Forces of the World

Soviet Air Forces

Part 3

Of the three major elements comprising the Soviet air force (Voyenno-Vozdushnyye Sily, or V-VS), one appears recently to have suffered a demotion. The strategic bomber force, the Dal'nyaya Aviatsiya (Long-Range Aviation) was a command in its own right until the reorganization of 1981, when its assets were apparently fragmented. Although still under ultimate command of the Soviet leadership, the various DA components are now assigned to the five Air Armies which provide the airpower for the USSR's five continental Theatres of Military Operations. They may thus operate in close liaison with nearby units of Frontal Aviation and the air defence command within a single Theatre, or be redirected according to the demands of a strategic situation. (Illustrative of this freedom of action is the employment of Tupolev Tu-16 'Badgers' in tactical, conventional bombing of Afghan guerrillas early in 1984.)

The new chain of command for DA may reflect its eclipse by the ICBM force as the prime method of nuclear deterrence. However, whereas in the USA or France ground-launched ICBMs are the responsibility of the air force, the USSR has an entirely separate military arm for this task: the Raketnyye Voyska Strategicheskovo Naznacheniya (Strategic Rocket Forces, or RVSN). Operated by 385,000 personnel, the RVSN has 1,398 silo launchers within its six Rocket Armies, including 818 which have been rebuilt and hardened since 1972.

Despite this impressive armoury, backed as it is by submarine-launched missiles, a useful role remains for the bombers of the DA, even though this concentrates on carriage of cruise missiles. Excluding naval air forces, the USSR has at its disposal 45 Myasishchev M-4 'Bisons', 115 Tupolev Tu-142 'Bears', 315 Tu-16 'Badgers', 140 Tu-22 'Blinders' and 140 Tu-22M 'Backfires'.

Most capable of these is the 'Backfire', which can cover the whole of North America when operating subsonically at high level from bases in the Soviet Arctic with the aid of inflight-refuelling. On shorter missions against targets in Europe and Asia, it can use its supersonic dash capabilities to good effect. A weapon load of up to 12000 kg (26,455 lb) may be carried by the 'Backfire' (some stores on external racks below the air intake trunks) and in addition to free-fall nuclear weapons, this includes an AS-4 'Kitchen' cruise missile semi-recessed in the belly. Under development is the AS-X-15, a far more capable missile which will take its place on the 'Backfire' (as well as the 'Bear' and forthcoming 'Blackjack') within the near future.

The AS-X-15 cruise missile is believed to have a range of 3000 km (1,865 miles) and, as such, will considerably improve the Soviet potential for low-level and stand-off attack in both theatre and intercontinental operations. It is expected to be followed by other weapons having an even greater range allied with the high accuracy achieved in US counterparts by the use of terrain-comparison guidance. (Missile range is a useful asset, but not as essential to the USSR as it is to the USA: 55 American cities with 74 million inhabitants are within 850 km/530 miles of the 100-fathom line in the Atlantic and Pacific Oceans, whereas the USSR has only six cities and 2.2 million people in the same exposed position.)

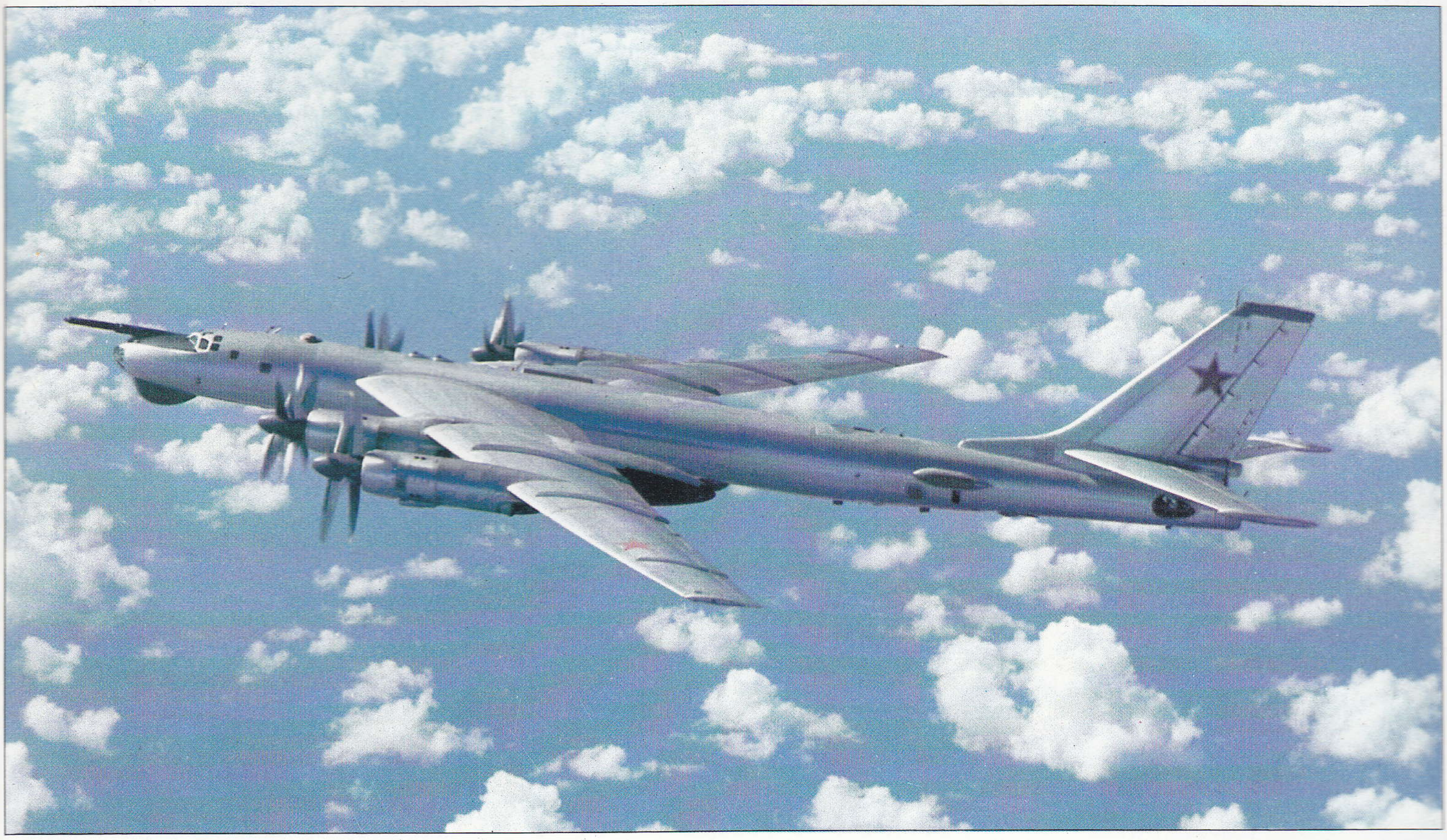
'Backfire' production continues at an alleged rate of 35 aircraft per year (in contravention of international agreements), and is expected to continue at this tempo until the end of the 1980s. Remarkably, manufacture is also under way (at Taganrog) of the Tu-95, some 20 years after main production was completed. The new variant, which entered service late in 1984, is the 'Bear-H' dedicated launcher for the AS-X-15.

Re-working of earlier 'Bears' is also in hand to produce the 'Bear-G' carrier for AS-4 'Kitchen' missiles. The subjects for this programme are the 'Bear-B' and 'Bear-C', which have been armed with AS-3 'Kangaroo' cruise missiles since the early 1960s. It therefore seems that the giant, swept-wing turboprop will remain as a useful component of the Soviet front-line inventory for many more years to come.

The 'Badger', though dating back to a 1952 prototype, is an equally valuable asset to DA for theatre attack (that is to say, medium-range nuclear strike of a non-strategic nature). In its 'Badger-G' form it carries two AS-6 'Kingfish' cruise missile or a pair of shorter-range AS-5 'Kelts' for the tactical role, whilst specialized ECM/jamming variants are available to accompany other bombers. The latest variant, the 'Badger-K', is assigned to electronic intelligence gathering.

AS-4 Kitchens are additionally carried by the Tu-22 'Blinder-B' which, with the 'Badger', constitutes the

A remarkable aircraft by anyone's standards, the Tupolev Tu-142 still lumbers around the world's oceans for hours at a time, collecting data from ground defences, naval exercises and anything it can fly near. The 'Bear-D' is the most common version, and is intercepted frequently by RAF fighters over the North Sea.



DA's medium-range element. The 'Blinder' was the USSR's first operational supersonic bomber, and is now assigned by the DA entirely to cruise-missile carrying, with the exception of a few reconnaissance models.

Apart from 170 aircraft (including 40 'Backfires') based in the Far East Theatre of Military Operations, the DA's assets are concentrated in the western sections of the USSR. It should be noted that in addition to the above, 530 tankers, electronic warfare and reconnaissance aircraft are operated by the DA, mostly as conversions of the older bombers.

Looking to the future, the DA will be considerably revitalized from 1987 when the Tupolev bomber known to NATO as 'Blackjack' attains operational status. As the Soviet Union's first truly intercontinental bomber, the 'Blackjack' is similar in appearance to the variable-geometry Rockwell B-1 in prospect for the USAF, but 25 per cent larger and with a gross weight of 267625 kg (590,000 lb). Its high-altitude dash speed is Mach 2.1, and with a range double that of the 'Backfire' it will be able to mount a hi-lo-hi mission against any target in the USA without inflight-refuelling. The conventional bombload of the 'Blackjack' is in the region of 13600 kg (30,000 lb), although it will also act as a carrier for the AS-X-15 and later Soviet cruise missiles.

A common sight around a US Navy carrier battle group is an escorting Tu-142. This 'Bear-C' is accompanied by a Grumman F-14A Tomcat from VF-111 'Sundowners'. Both aircraft share one thing: they are both many miles from their home. Soviet long-range aircraft have been an ever-increasing sight over the world's oceans.

Having dealt with the might of the DA, it may appear to be an anti-climax to consider the equipment of the Voyenno-Transportnaya Aviatsiya (Transport Aviation, or VTA). But this is not so, for this component of the V-VS is a vital element in Soviet defensive and offensive strategy, as evidenced by the massive airlift of troops and their equipment into Afghanistan during December 1979.

The VTA operates some 600 four-engine aircraft and many more smaller types, but has call on another 1,400 medium and heavy aircraft of the airline, Aeroflot. Modernization of the force is maintained from annual production of over 300 transport aircraft in all categories, of which 75 go to VTA.

Forming the backbone of Transport Aviation is the Antonov An-12 'Cub' turboprop, of which some 375 are being replaced by the four-jet Ilyushin Il-76 'Candid'. 'Cubs' will carry 100 paratroops or 20000 kg (44,090 lb), but their substitute has been designed to transport twice the payload over five times the range (and in the rigours of the Siberian winter, if required). Some 250 'Candids' have been delivered so far.

Presently, the heavy-lift element of VTA consists of 50 Antonov An-22 'Cocks' shared with Aeroflot. Powered by four contra-rotating turboprops, the 'Cock' will lift up to 80000 kg (176,365 lb), including missiles such as the SA-4 'Ganef' on its transporter, and is the only VTA aircraft able to carry a T-62 tank.

This distinction will be lost in 1987 or 1988, however, when the gigantic Antonov An-400 'Condor' enters service. Similar to the Lockheed C-5 Galaxy, but larger, the 'Condor' prototype is currently the biggest flying aircraft in the world. With the VTA, it will carry a load of 120000 kg (254,550 lb) for 4600 km (2,860 miles) or up to 200 paratroops. Its internal volume is sufficient for the largest main battle tanks and all the elements of an SS-20 mobile intermediate-range missile system.

Remembering the role played by USAF heavy transporters in the seizure of Grenada and their use in reinforcement exercises to Europe and the Middle East, it is not difficult to deduce that the Soviet Union is seeking a similar ability to act rapidly on a global scale. With the service entry in a few years' time of the 'Blackjack' intercontinental bomber and 'Condor' carry-all strategic transport, the USSR will have drawn parallel to Western capability in a further two areas.

The early MiG-25 'Foxbat-As' have recently been updated to 'Foxbat-E' standard with some capability against low-flying targets. Main differences include an infra-red sensor under the nose and strengthened structure. It is likely that more powerful engines have been fitted.